

The **MINING** *CONGRESS* *JOURNAL*

IN THIS ISSUE

National Labor Relations Act

Gold Mining in California

Commercial Production of Metallic Beryllium

Conveyor System at Barnesboro Mines

Conveyor Mining

Mucking at North Lily Mining Company

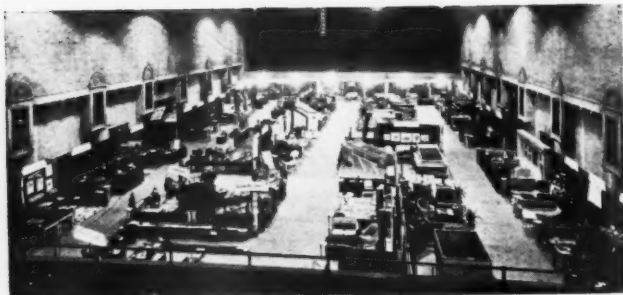
Mechanical Loading in Some Metal Mines

The Coming Coal Convention and Exposition

Contributors:

*D. A. Callahan, Chas. H. Segerstrom, Edgar Larsen,
C. P. Brinton, L. H. Schnerr, J. S. Finlay*

APRIL
1935



OPPORTUNITY for YOU—



... The American Mining Congress

annually offers to the coal-operating man the OPPORTUNITY of the year to become posted upon the most modern trends in production methods; to exchange ideas with operating men from all fields; to view under one roof the largest exhibit of coal mining equipment in the world.

... The 12th Annual Meeting will be the finest of them all. 106 manufacturers will exhibit; more than 2,000 operators will attend.

... Plan now to be present and take advantage of this splendid opportunity.

MAY 13-17, 1935

MUSIC HALL

CINCINNATI, OHIO

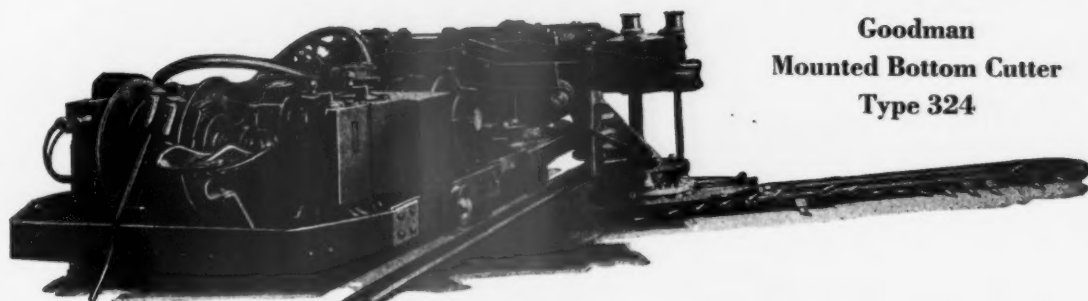
Applications for Reduced Fare Certificates
should be sent

THE AMERICAN MINING CONGRESS

309 MUNSEY BUILDING
WASHINGTON, D. C.

Speed, Speed and More Speed

with the Goodman Mounted Bottom Cutter



Goodman
Mounted Bottom Cutter
Type 324

Wide Work — Slabbing — Narrow Work

Open Enclosed or Government Approved Electrical Construction

Self-Contained—Self-Propelled

Cuts in Either Direction

Three-Point Support

Accessible

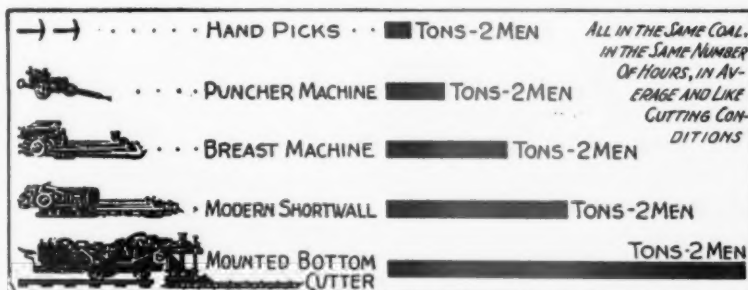
Safe

Easy to Operate

Cuts a Smooth Floor

Adjustment for Endwise Tilting of Cutter Bar

Cutting Range: 8 Inches below Rail Tops to 7½ Inches above



ON THE LEFT!

Note the progress in SPEED and EFFICIENCY of undercutting Goodman has made from early days to the present time.

An Ideal Bottom Cutter for the New
Goodman Mounted Track Loader

By the way—the New Goodman Loader will be in operation at the convention!

GOODMAN MANUFACTURING COMPANY
Locomotives - Loaders - Coal Cutters
HALSTED ST. at 48TH. CHICAGO --- ILL.
PITTSBURGH-WILKES-BARRE-HUNTINGTON-BIRMINGHAM-ST LOUIS-DENVER-LOS ANGELES

The MINING CONGRESS JOURNAL

APRIL
1935



VOLUME 21
NUMBER 4

Editorials:

Coal and the Recovery Act.....	9
The Wagner Labor Disputes Act.....	10
Progressing Coal Industry.....	10
An Important Government Function.....	10
All About Taxes.....	11
The Political Situation.....	11
The World Do Move.....	11
Facts About Minerals.....	11

Feature Articles:

National Labor Relations Act.....	12
<i>By D. A. Callahan</i>	
Gold Mining in California.....	14
<i>By Chas. H. Segerstrom</i>	

Legislation:

Of All Things.....	20
Wheels of Government.....	21

Practical Operating:

Conveyor System at Barnesboro Mines.....	27
<i>By C. P. Brinton</i>	
Conveyor Mining.....	30
<i>By L. H. Schnerr</i>	
Mucking at North Lily Mining Company.....	33
<i>By J. S. Finlay</i>	
Mechanical Loading in Some Metal Mines.....	36

News of the Field:

The Coming Coal Convention and Exposition.....	15
Commercial Production of Metallic Beryllium.....	26
<i>By Edgar R. Larsen</i>	
Personals.....	40
Mining Events.....	41
News of Manufacturers.....	49

J. F. CALLBREATH
Contributing Editor

E. R. COOMBS
Editor

HOWARD B. DRISCOLL
Advertising Manager

G. B. SOUTHWARD
Associate Editor

B. E. CHAMBERS
Asst. Advertising and Business Mgr.



Published by The American Mining Congress, JULIAN D. CONOVER, Secretary, Washington, D. C. Copyright, 1933, by The American Mining Congress, Munsey Bldg., Washington, D. C. Entered as Second Class Mail Matter January 30, 1915, at the Post Office at Washington, D. C. Published 12 times annually—the first of each month. Yearly subscription, United States and Canada, \$3.00; Foreign, \$4.00; single copies, \$0.30.

Gibson REFLECTIONS



YOU can sit in a plush chair
and be as lonely as a poet
at a prize fight. And you

can sit on a stump and be happy and carefree.
It just shows that peace o' mind isn't in a plush
chair or in a hand-carved bed. It's in the
atmosphere. The good will of those around
you. In the hundreds of little things that are
the biggest things in life.

The Gibson? Well, it has plenty of easy
chairs and beds as soft as the answer that
turneth away wrath and all the gadgets that
luxury requires. And yet, the Gibson Hotel
shows what I mean. They call it hospitality. I
call it real friendliness and consideration. I
call it attention to the little things. To me it
isn't a hotel. It's a place to live.

* * * *

Rates:

From

\$2.50 Single

\$4.00 Double

F. W. Pallant
General Manager

1,000 Rooms—
All with Private
Bath

CONVENTION HEADQUARTERS—

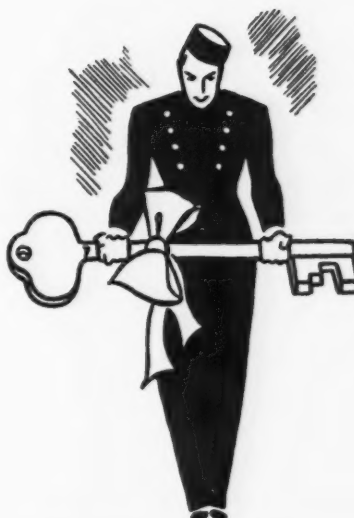
The Gibson is nationally noted as the
convention hotel of the Midwest.
Exceptional convention and exhibit
facilities.

A F A M O U S L A N D M A R K

GIBSON Hotel CINCINNATI

WHERE WE SAY
**WELCOME TO
CINCINNATI**

... AND MEAN IT



IT pleases us very highly to have Cincinnati often
remembered for the beauty and hospitality of the
Netherland Plaza. We've 800 luxuriously livable
rooms, each with tub and shower bath, radio, and
running ice water. Five restaurants . . . including
the smartest cocktail rendezvous in town, and a
shining, hurry-up coffee shop . . . where you'll like
both food and prices. An 1100-car automatic park-
ing garage right in the building . . . so you step
from your car into the hotel elevator. The Nether-
land Plaza is the newest hotel in the Queen City, of
course, and (we're told) one of the most luxurious in
all the world. Yet rates start at only \$3.

NETHERLAND * PLAZA *

WILLIAM O. SEELBACH, Manager
Directed by National Hotel Management Co., Inc.
RALPH HITZ, President

Other hotels under the direction of Ralph Hitz:
Hotel New Yorker and Hotel Lexington, New York;
Book-Cadillac, Detroit; The Adolphus, Dallas;
Van Cleve, Dayton

NITRAMON

T R A D E

SOME FACTS ABOUT THIS



This is the first announcement in trade publications of NITRAMON—a new product developed during the past four years in the du Pont research laboratories.

This new patented blasting agent when manufactured and sold by the du Pont Company is identified by the trade mark NITRAMON. It differs radically in properties from any blasting material previously used in well-drilling operations.

Probably one of the most important of the many advantages of NITRAMON is its safety in handling. It is not an explosive in the accepted sense of the word. When subjected to the usual tests applied to explosives, it cannot be detonated by:

—a commercial blasting cap

—or Cordeau—or flame—or by impact

The full blasting strength of NITRAMON is developed, however, when a detonating primer of sufficient energy is used.



The i
handl
sealed
which
handl

NITI
of its
nitrog

It is a

NITR
clusiv
of wei
is, in b
They
from 4

NITR
open-p
where
practic

NITRAMON

M A R K

NEW BLASTING MATERIAL

The insensitiveness of NITRAMON to ordinary handling makes it possible to pack it in tightly sealed metallic containers—the water resistance of which is unlimited, provided cans are properly handled and loaded.

NITRAMON is non-headache—not only because of its package, but also because it contains no nitroglycerin.

It is absolutely non-freezing.

NITRAMON is made in five grades, A to E, inclusive, all having the same high strength per unit of weight. These grades differ only in density, that is, in bulk strength or strength per foot of bore hole. They are packaged in cans ranging upward in size from 4 inches diameter by 16 inches in length.

NITRAMON is recommended only for *quarrying, open-pit mining, stripping* and other operations where well drills are used and large holes are the practice.

The photos shown below were taken at a typical quarry where fourteen holes, 6 inches in diameter and averaging 105 feet deep, contained the necessary NITRAMON.

Not only were potential hazards to life and property reduced, but results, excellent in point of execution, were secured at a *substantial saving in cost* as compared with explosives previously used.

A bulletin containing information relative to methods of use, grades available and other practical information will be sent on request. Please address nearest office.

E. I. DU PONT DE NEMOURS & CO., Inc.
Explosives Department Wilmington, Delaware

BRANCH OFFICES:

Birmingham, Ala.; Boston, Mass.; Chicago, Ill.; Denver, Colo.; Duluth, Minn.; Huntington, W. Va.; Joplin, Mo.; Juneau, Alaska; Kansas City, Mo.; New York N. Y.; Pittsburgh, Pa.; Portland, Ore.; Pottsville, Pa.; St. Louis, Mo.; San Francisco, Calif.; Scranton, Pa.; Seattle, Wash.; Spokane, Wash.; Springfield, Ill.; Wilkes-Barre, Pa.



REG. U. S. PAT. OFF.





YOUR HAULAGE SYSTEM
IS THE *"Bottle Neck"*
THROUGH WHICH YOUR
TONNAGE
MUST PASS

Use all the modern production equipment you wish. Fine. But when all is said and done, your track controls your tonnage. Carnegie Mine Ties are the basis of a trouble-free track—one where delays and derailments will not tie up production schedules. • Carnegie Ties are available in six styles, suitable for every requirement. Light portable ties for room work. Heavy-duty ties for main haulage. They will transform your track from a hindrance to a truly efficient aid to production... Get acquainted with their many advantages.

CARNEGIE STEEL COMPANY • PITTSBURGH

United States Steel  *Corporation Subsidiary*

Coal and the Recovery Act

THE great majority of the business men of America who made themselves responsible, under the codes required by the National Recovery Act, did so under pressure, and because of a threat that the national Government would boycott all products not qualified to fly the Blue Eagle.

A minority of these code signers regarded the NRA as the best method through which industrial recovery could be accomplished.

The tyranny of a Government boycott and the appeal for cooperation with the Government went hand in hand in forcing codes upon American business.

In return for this surrender of individual control business was assured, in consideration of the increased cost of production made necessary under the codes, that the Sherman anti-trust law restrictions would be relaxed and that the code signers would be permitted to charge consumers the additional amounts required to meet cost of the shorter hours and higher wage provisions.

To put it differently, business was authorized to take from the consumers such amounts as were necessary to pay the increased wages for shorter hours at the demand of organized labor.

Far-sighted business men fully understood that to increase prices, to a consuming public already unable to buy at the old prices, would add to the embarrassments of an already impossible situation and make more difficult the return to normal conditions.

Business was also keenly alive to the importance of reconstruction first, leaving reformation of improper conditions to be worked out when the necessary cost of reformation would be less disturbing.

Notwithstanding this the administration, at the demand of organized labor, insisted that reform and reconstruction should be undertaken together.

A great spending program was inaugurated for the purpose of increasing the buying power of the nation. The funds for this increase of purchasing power could be taken only from capital then in existence or by borrowing. Both sources were utilized.

Increased current taxation, unbalanced budgets and enormous borrowings, which business must pay back in the future, were resorted to in order to bolster up this unsound recovery program, the principles of which were either in violation of the Constitution of the United States or of the law of supply and demand.

After two years of tyrannical blustering, national boycotts, prosecutions, both criminal and civil, against the violators of this unnatural law, those in charge of the attempted administration of these codes now concede that a large part of these codes were blunders, that they should be immediately abolished and that the Government should hereafter centralize its effort upon the enforcement of those codes in a very few controlling lines of business over which Congress had a right to legislate—namely, those which apply to inter-state business.

And now Congress is faced with the intensely difficult problem of getting these code controlled industries back to the moorings from which, in crafts entirely unseaworthy without Government control and support, they were forced to sea.

The question now is whether these codes which expire on June 16, shall be renewed as to that part of business over which Congress has jurisdiction or whether the whole structure shall be allowed to lapse.

A few industries have been greatly benefited by the power

to regulate production and to control markets which, without the code, were acts forbidden by the anti-trust laws.

These industries have built up at great expense and trouble, vast industrial machines for the enforcement of codes and have made themselves so dependent upon these governmental aids as to make an extension of code authority a necessity if chaos is to be prevented.

Enforcement of codes as to all operators must be made effective or the whole structure will necessarily fall. The weakness of the system as thus far operated has been the lack of complete enforcement.

It is the plain duty of Government prosecuting agencies either to enforce obedience as to all or to relieve all from code obligations.

Congress is thus confronted with a most serious problem of meeting conditions, as they now are, not as they ought to be.

The coal industry of the United States, as far as the public is concerned, has always been well managed.

In modern days, power is the basis of all prosperity. The bituminous coal industry of the United States has supplied American industry with the cheapest power in the world.

Because of uncontrolled competition the coal industry has not been profitable but it has supplied industry with coal at and below the cost of exceedingly efficient production.

So far as the consumer is concerned the highest engineering and mechanical skill has been applied to its operation, and as a whole coal production has been one of the best functioning industries in the country.

There was most bitter opposition to the adoption of codes by large segments of the industry. These protested a departure from the main highway, which they had traveled before. The road, which they were forced to follow, has led them miles away from the main road and it would be bitterly cruel now if Congress should fail to continue its support until such time as the industry can get back to that highway upon which it and all other industries should travel.

The benefits which have been enjoyed by the coal industry have come from those provisions which permit a relaxation of anti-trust law provisions.

For many years, the wasting industries, those industries dealing with resources which once exhausted cannot be replaced, made special and almost continuous appeal to the Government for the right to so regulate production as to meet market demands under Government supervision, through which minerals could be put upon the market at reasonable prices and the highest conservation of reserves could be secured.

This is still a crying need of the wasting industries.

Congress has no higher nor more difficult duties than to see that the Constitution is not violated under cover of law; that the nation's resources are not wasted; that industry shall be relieved of the increasing costs of government and that assurance shall be given to justify confidence in future business conditions.



The MINING CONGRESS JOURNAL

NUMBER 4
VOLUME 21



APRIL
1935

A Journal for the entire mining industry published by The American Mining Congress

The Wagner Labor Disputes Act



Too much power in the hands of any group always has led and always will lead to contempt of those principles which should actuate society.

The past two years have seen a struggle between our two major groups of society—those who employ and those who are employed. Capital—the employer—in bygone years had the reputation, deservedly or otherwise, of a “public be damned” attitude, and there was a sufficient number of examples of unfairness of this group to lend some fire to the smoke. More recently, labor—the employed—has adopted a rule-or-ruin attitude which now seems to have culminated with the efforts to enact the Wagner Labor Disputes Bill.

It is well for the great unorganized groups of our citizens to realize that human greed is human greed whether it be applied to capital or labor, and that no matter which has the balance of power in its favor it will always want more.

Unionized labor, speaking generally through the American Federation of Labor, is making a desperate effort to get the balance of power. There are about 2,800,000 members of unions affiliated with the Federation who are paying dues. It has been said authoritatively that these dues amount to approximately \$24 a year a member. Thus, it is evident that the Federation has a tremendous sum available to prosecute its program.

The Wagner Bill proposes the creation of a new National Labor Relations Board with tremendous power. Many feel that its enactment would outlaw organizations of workers which have the cooperation of employers. It prohibits the employer from protecting himself against the aggressive programs of union officials. It establishes the doctrine of majority-rule, so that 51 percent of any organization can completely dominate the other 49 percent whether or not they wish it. It sanctions closed shop agreements and is designed to compel all employees to join a majority-rule union whether or not they agree with it, and to pay dues to it.

Supposing that this bill shall become law, what then? At the present time there are between 18,000,000 and 20,000,000 persons employed. Working at peak production, American industry can employ some 35,000,000 to 40,000,000 workers. Under the provisions of this bill, all of these workers would conceivably pay annual dues to one central organization, such as the Federation. With minimum dues of \$2 a month, it is readily seen what a colossal sum could be placed in the hands of one group to be used wisely or unwisely as the case may be. Even admitting wise, sound leadership of such a central organization, human greed has not been eliminated, and the desire of human beings for greater and greater power cannot be legislated out of these human beings.

MANY of the proposals floating around the world, and particularly the part of it in which we live, lose sight of the very fundamental fact that we can never escape human greed.

A long continued fight between capital and labor means but one thing—loss for both sides. One side or the other may secure a temporary advantage, but in the end both lose. The owners of a business are entitled to their constitutional rights; they are entitled to a profit; they are entitled to freedom of action. The workers are entitled to the very best wage that industry can pay; they are entitled to every safeguard for their earning power. But, whatever capital or labor earns *must come out of the earnings of industry*. We cannot pay labor out of capital without disastrous results, nor can prosperity be achieved by a lowering of the worker's standard of living through drastic decreases in wages.

The Wagner Bill would grant too much power to one group of persons. There is an old saying that if you “give a calf rope enough it will hang itself.” Now that labor is in the saddle and is getting a taste of power, it is slowly moving toward disaster and carrying industry with it. A minority of organized workers is leading the greater mass—the huge unorganized group—to economic disaster.

Progressing Coal Industry



unit when it comes to operating practice stands as a shining example of what can be done by industry when an effort is made.

Beginning early in January, a committee of 77 coal men undertook to canvass the industry and to develop a program upon operating problems for the twelfth annual meeting of the Coal Division of The American Mining Congress, scheduled for Cincinnati, Ohio, the week of May 13. They just have released their first preliminary program. It is a masterpiece of cooperative effort. In the nine sessions planned, each is replete with topics designed to give the maximum of operating data to this industry. All papers are entirely voluntary, and each paper has full information on costs and results obtained.

We believe that this industry sets a real standard for this type of cooperation.

An Important Gov- ernment Function



satisfaction of the employers of labor. The President recently said, “Wealth grows when men cooperate; but it stagnates in an atmosphere of misunderstanding and misrepresentation.”

WHATEVER of criticism may be levelled at the coal industry for its inter-sectional disputes and its inability to negotiate wage contracts, its performance as a cooperative

IT IS said that the President is watching, with growing apprehension, the efforts of organized labor to ride, successfully, the crest of the wave, and the equally growing dis-

Government is organized for the protection of the individual rights of its citizens. If Government fails to preserve an equality of opportunity for contestants it has failed in one of its most important functions. Giving all of the benefits of Government for the protection of capital necessarily leads to intolerable conditions; giving all Government's support to labor leads to an equally unsatisfactory condition. Government to perform its most useful function must keep itself in a judicial attitude, ready to protect the fundamental rights of both parties to any controversy. It is but natural that both sides of industrial controversies should struggle for supremacy. It is the function of Government to see that each is restricted to those rights which are fundamental.

All About Taxes



WHEN an analysis of taxation is undertaken, it is quite apparent that little more can be added without breaking the back of industry, for, according to the National Industrial Conference Board, the American people are now paying 9½ billions a year in taxes—an amount equivalent to one-fifth of the national income. For the year 1932, the latest year for which data are available, debt service (interest and retirement) for all governments combined (State and National) was equivalent to 16.5 percent of gross expenditure and 29.2 percent tax collections.

The enormous decline in the yield of Federal income taxes and property tax delinquencies paint an interesting and alarming picture, which should be given most serious consideration. Federal income taxes declined from \$2,411 million in 1930 to 818 million in 1934.

Industry cannot bear a heavier tax. It is a wise decision of the Administration not to burden the general public with new tax levies at this time.

The World Do Move



MINING and agriculture have been recognized as the two great basic industries. Even agriculture in its modern form of operation is dependent upon products of the mines.

It will come as a shock to many of those who have regarded the mining industry as one of the first of the fundamental industries to realize that the farm is now becoming a competitor of the mining industry and that through the processes of synthetic chemistry clothing, structural and building material, fuel, and many other necessities are being manufactured from farm products. This condition, while seemingly a test against the prosperity of the miner, in fact will become the greatest factor in making possible mining operations. No process has been or is likely to be developed which may become a substitute for the iron necessary in the manufacture of machinery. Synthetic building material may take the place of brick and cement but never the structural steel necessary to all large building enterprises. As the fuel supplies of the world are exhausted it will be a great blessing if these may be replaced by synthetic fuel produced from farm waste. The possibility of supplanting the use of minerals by the products of synthetic treat-

ment of farm waste becomes a novel field of speculation as to whether these theories may be developed rapidly enough to take the place of our mineral supply when same shall have become exhausted.

Facts About Minerals



EVERY state in the Union produces, to some extent, minerals. Nobody seems to clearly understand that our industrial prosperity actually rests upon a mineral structure, its healthy condition and its efficient utilization. There are 3,071 counties in the United States, 2,024 of them are mineral producers. Minerals enter into practically every phase of our present-day civilization. Among the industries by-product to minerals are motion pictures, tableware, kitchen utensils, automobiles, railroad rails and coaches, wire, roofing and building materials, printing, chemicals, plumbing, ink, paints, medicines—in fact, practically every phase of human endeavor and every phase of human existence, necessity, comfort and luxury depend upon a mineral base.

In all of its ramifications—mining, refining, processing and merchandizing—approximately 25,000,000 persons are dependent upon minerals for a livelihood. Minerals are capable of producing in a single year some seven billions of wealth. They pay better than 22 percent of the total Federal income and, in addition, pay huge sums for local and state taxation.

This gigantic enterprise, known as the second largest industry of the United States, is probably the most important factor in our industrial life today. Real consideration should be given to it by state and national government. It should be aided and nurtured and should be looked upon as something more to be prized than the goose that laid the golden egg.

The Political Situation



CONGRESS has been in session more than three months, yet the country is still fairly vague concerning its intention on such vitally important subjects as (1) the future of the National Industrial Recovery Act; (2) Social Security; (3) the so-called natural resource legislation; (4) the many labor bills; (5) the transportation control proposals.

Never has a Congress had before it more important matters for decision; never has industry awaited Congressional action with greater trepidation. To the limited list above, which constitutes sufficient legislation to employ all of the talents of any Congress, must be added demands for cash payment of a bonus to veterans; wide and sweeping changes in credit control; and proposals for rigorous and detailed control over private power services.

No wonder Congress is bewildered. After all, Congressmen are only human beings, not human calculating machines where the answer can be obtained by pushing a lever. A Congress of superhumans could not hope to cope with the gigantic problems before the 74th session.

The President and every member of Congress knows that only a small proportion of the proposed legislation can be acted upon. Public and business suspense should be ended as quickly as possible, and unless it is business will remain uncertain and uneasy. It is earnestly hoped that Congress will take full cognizance of these facts, and expedite its action, passing the important bills, and removing the threat of unwise and unsound legislation that is now such a hampering influence.

NATIONAL LABOR RELATIONS ACT*

By D. A. CALLAHAN

THE board of directors of the American Mining Congress has directed me to present to you a statement on behalf of the mining industry which it is organized to represent throughout the United States. Those charged with the responsibilities of management in our industry have considered at length, and with care, the startling changes which it is apparently intended to bring about in the relation between employers and employees in the entire industrial structure of this nation.

In the mining and attendant industrial enterprises of the United States, employment is given to a material proportion of the industrial workers of the country. Upon mining and its attendant industries directly and indirectly rests the welfare of about 25 millions of our population. We therefore ask your most careful consideration of this statement of position which we present as our firm and considered conviction in the vital matter before you.

The American Mining Congress, at its annual meeting on December 14, 1934, adopted the following among other resolutions:

"We believe that labor should be given the right to representation in collective bargaining by those of its own selection; that the plan of proportionate representation of labor in any industry should be recognized and that the right of the individual, not a member of a labor organization, to conduct bargaining by means of his own choice, shall not be restricted or abridged. We condemn any policy which shall constitute any labor organization, national or international, the sole representative of all those employed within an industry.

"Employees who desire to work should be fully protected by the police powers of constituted government, and mob law should not be tolerated.

"We endorse the principle that every organization of employers and employees shall be made equally subject to public authority, legally answerable for its own conduct or that of its agents, and equally subject to judicial remedy."

We protest the passage of the National Labor Relations Act (S. 1958) for the following specific reasons:

First. Stripped of all camouflage, the bill is a deliberate attempt to fasten upon industry in this country a system of organized labor affiliated with the

national labor organization known as the American Federation of Labor.

Second. The bill deprives employers of the right to counsel and advise with their employees as to their method of organization for collective bargaining, or of considering the relationship which shall exist between employers and employees in any industry.

Third. The bill sets up a political board subject to influences which have no relation to the problems of industry and confers upon that board powers which rival those granted to the most autocratic bureaus of our present government.

Fourth. The bill sets up a procedure violating the principles of the orderly adjudication of disputes as they have been recognized in courts of law, grants inquisitorial powers which unquestionably would become powerful agencies of persecution, and places employers, good and bad, upon the defensive in the operation of legitimate and honorable business.

Fifth. The bill provides that representatives for collective bargaining "in a unit appropriate for such purpose" shall be chosen by a majority of all employees in such unit and shall thereafter be the exclusive representatives of all such employees. The "unit appropriate" is to be determined by the board, and the board may also determine when and under what particular method such representatives shall be chosen. We have failed to find any limitation as to how often elections may be held, or as to how often the board may change its mind as to the type of unit to be recognized.

To treat these objections seriatim: I know that it has been asserted, and will be asserted again, that this bill is not in aid of what is known as organized labor, but is intended purely to grant a freedom of organization to labor in order that it may treat collectively with employers. The picture of what this bill is intended to bring about has been painted most beautifully in this hearing, but I must beg leave to differ most decidedly and to assert that under the provisions of this bill there will be no company unions and that every liberty and opportunity will be given to paid organizers of federated labor to press into the ranks of their organizations all employees in the nation.

Consider the practical working of it: Men employed in a given industry who are not members of union labor and have no acquaintance with methods of organization, who perhaps have not seen any need of it in the past, once this bill has become a law, will have dinned into their ears continuously that it is the desire of the Government itself that they organize and treat with their employers in this manner. They cannot even go to their employers for advice and counsel, because the employers will be obliged to tell them that under the provisions of section 8 of this bill, it will be an unfair labor practice for them to "dominate or interfere with the formation or administration of any labor organization," et cetera. All the employers can do, is to wait until the employees have organized, and then receive complaints if any are made.

But now along comes a labor organizer, representing a giant organization, spreading over the entire nation, a secret oath-bound organization, if you please, with highly paid officials, district organizations, local unions, a headquarters at Washington, and, above all, a political influence which will be quite powerful with politically constituted authorities having to do with the administration of this act. It is represented by them that through payment of a nominal sum each month, the employees of the industry can be organized, and all the strength and might of this tremendous national organization will be at the beck and call of the humblest employee. Perhaps in a state of perplexity the employee will go to his employer whom he has known for years and in whom he has the greatest confidence; he may ask his advice, but it cannot be given—the employer must stand aside and permit the agencies of organized labor to influence and even intimidate his employees with whom he has lived in harmonious relations for so long, and once that is done, the labor disputes envisioned by this act automatically arise. Once the industry is organized, the need is for action, and employees learn from experts just how many grievances they have which they never dreamed of before. It will be like reading the advertisement of a quack doctor and arising from such a study with the firm belief that one is in imminent danger of death. This then will be the first effect of the passage of this bill, and it will be done upon the theory that employers of the country generally

* Presented to the Senate Committee on Education and Labor by Donald A. Callahan, president, Callahan Zinc-Lead Company, Wallace, Idaho, and member of the board of directors of the American Mining Congress.

have been grinding down their employees, taking advantage of their necessities, and imposing onerous and unfair conditions.

I have not overdrawn the picture. These very conditions have been realized to an extent under the operation of section 7(a) of the National Industrial Recovery Act; they will simply be accentuated in the event this bill is passed and the employer no longer has the right even to counsel and advise with his employees as to the method of their organization. I say to you, that the mining industry of this country does not deserve treatment such as will be imposed if this Act becomes a law. It is an honorable business which has paid its employees well, striven to surround them with the greatest safety in a naturally hazardous employment and provided working conditions which are superior to those found in any other country in the world. During the depression the mining industry has sacrificed much to provide a living wage for its employees. It seems to have earned, along with all other employers of the country, perhaps only the opprobrium of the Congress of the United States. If there is one dominate note which may be gathered from the entire contents of the bill which your committee has under consideration, it is the false note that employers need to be policed and restrained in their relations with their employees.

This bill sets up a political board. Its members are to be appointed by the President, subject only to the consent of the Senate. They may all be members of organized labor; they may all be employers, or even worse, they may all be men who have earned Government salaries in return for delivering political goods. In this, I am simply giving expression to a sentiment which has been impressed upon me by watching political events over a period of many years. Not only is the board to be political, but its employees likewise are to be political. There is to be no civil service in the administration of this Act. The merit required of the employees, attorneys, experts, examiners, regional directors and what not, is not to be reckoned except upon the basis of political expediency or political service. In saying this I am merely taking into consideration the actual language of the bill itself. Any Act providing for employment of public officials which places no restrictions upon appointment must be taken as providing for a personnel such as has followed from Acts of similar character.

Having created this political board, the bill goes on to confer upon it certain powers which, to use very mild language, must be considered extremely autocratic. First of all, the board will have authority from time to time to "make, amend and rescind such rules and regulations as may be necessary to carry out the provisions of the Act," and these rules and regulations shall be effective upon publication in the manner which the board shall prescribe. I do not believe the members of this committee are naive enough to doubt that the first effort of this board will



D. A. Callahan

be to find many directions in which such broad powers can be exercised. It is the history of boards such as this that they know no limitations and brook no interference. We will find this simple board of three coming to the Congress, year by year, with increasing demands for appropriations to carry out its far-flung activities and within a short time visitors to the nation's capital will be pointed out another building filled to overflowing with government employees engaged in the humanitarian business of keeping the employers of America from violating the four specific inhibitions contained in section 8 of this bill.

Just imagine what wonderful opportunity there will be for new snooping and prying as the employees of this inquisitorial body go about performing the duties enjoined under section 13 of the Act. I ask you in all seriousness, if the honest and conscientious employers of this country, whose name is legion, deserve of the Congress of the United States a measure such as this, which will subject them at all times to inquisitions such as can be conducted under the provisions of this Act?

Then again, what about the hearings themselves, where no rules of evidence are to be taken into account; where hearsay, rumor, or innuendo are to be received and considered on the same basis as statements of fact by witnesses. What about the provision of making a finding of fact based upon such a hearing binding upon a court of law to which the controversy may finally be transferred? What about the power granted to summon a defendant from Maine to California upon a three day notice? Surely it is not the intention of the Congress of the United States to crucify all industry because in some instances employers have not dealt fairly with their employees.

It has been said that this bill provides for the rule of the majority and surely that is a good American doctrine. It is, indeed, where opportunity has been given to lay facts before those who are to do the voting. Even in this country I do not think much of the decision of a majority where there has been no honest and free discussion of the issues which

are to be decided. In this case, the employer must stand helplessly by, see the paid and expert organizers of labor present their glowing picture of advantages to be gained and then, when but one side of the issue has been presented, abide by the decision of a majority which binds the minority, regardless of its desires. In the language of the resolution of the American Mining Congress, we urge "that the plan of proportionate representation of labor in any industry should be recognized," and that 49 percent, or any other percent of employees should be permitted to do more than simply "present grievances" to their employers. Other spokesmen before your committee have presented this phase of the subject in an able manner. We of the mining industry ask you to give it careful consideration.

Let me conclude by pointing out to this committee the very grave danger of the precedent which may be here established. For years we have heard the complaint of organized labor, that it has been discriminated against politically. It is only within the past few years when abnormal economic conditions brought about an abnormal political sentiment that we have seen organized labor riding the waves of political recognition. The pendulum has swung so far that the small body of men compactly organized in the American Federation of Labor have been able to see realized their dreams of increased membership through their representation that the policy of government was favorable to their organization. That pendulum may swing backward just as far as it has swung forward. Changing economic and political conditions may bring about the organization of the board, provided in this bill, upon a basis not only not favorable to, but violently opposed to organized labor. Is organized labor ready to accept the implications of such a change in conditions? Is it ready to accept the autocratic domination of a political board such as is provided in this bill, when the personnel of that board may be entirely unfavorable to its ideals? I point this out merely to remind you that you are establishing here a precedent, that you are writing into the law of the land a policy in the relationship between employer and employee, and that this policy is not written for today or tomorrow, but is to have a definite place in the economic and social structure of the nation for years to come. This bill is not being considered as an emergency measure—it is a bill aimed to determine differences and disputes arising in one of the most intimate relationships existing among our people; it is to be a policy which will change in its administration as conditions change politically and otherwise, and I for one, as an employer and a citizen, don't wish to see such a question raised as a political issue in this country.

I ask you members of this committee, charged with a very grave responsibility, to consider the full consequences for the future as well as for the present of the action which you are asked to take in considering this bill.

GOLD MINING IN CALIFORNIA

By CHAS. H. SEGERSTROM*

IN DISCUSSING gold mining in California, it is well for us to remember the importance of all other mineral deposits. The thin outermost crust of the earth directly or indirectly accessible to us might be defined as a shell, having a thickness of ten miles, and when we consider that the deepest shafts attained are only about 8,000 feet deep and the deepest bore holes about 10,000 feet deep, we then realize how small a portion of the earth's crust has been subject to mineral development.

In this ten mile crust it has been estimated that the average composition of the rocks consist *primarily of eight principal elements*, which make up 98.62 percent of the igneous rocks. They are: Oxygen, 46.59; silicon, 27.72; aluminum, 8.13; iron, 5.01; calcium, 3.63; sodium, 2.85; potassium, 2.60; magnesium, 2.09.

Therefore, most of the *rarer metals* fall into a class where the average is below 0.1 percent. Gold, platinum, silver, copper, lead, zinc, antimony, arsenic, tin, quicksilver, molybdenum, tungsten and others are in amounts less than .01 percent. These percentages of useful metals in the rocks as heretofore mentioned, do not by any means indicate the amount available for industrial use. The metals in the deposits of useful minerals comprise only a minute fraction of the quantity of metals in the crust—a fraction which has been locally accumulated by some process of concentration, and it is on these deposits or concentrated areas of mineral lands that mining development is carried on.

The average man does not fully realize the extent of these minerals, both

metallic and non-metallic which are classified under these headings. These minerals and mineral products comprise over 57 percent of the freight carried on our major railroads. It is well therefore to bear in mind that the products of the earth which are used for the benefit of mankind are many and valuable and that the *mineral industry* constitutes one of the greatest industries of our nation.

In California we have a diversity of mineral products that are probably not equalled by any state in the union. We produce asbestos, antimony, asphalt, bituminous rock, borax, cement, clay, copper, gold, granite, gypsum, lead, coal, lime, limestone, rock and sand, manganese, magnesite, marble, mineral waters, mineral paint, natural gas, oil, petroleum, platinum, pyrites, quicksilver, salt, sandstone, serpentine, silver, slate, soda, sulphur, besides scores of other deposits of minerals, and we also have large deposits of other material such as diatomaceous earth, volcanic ash and many other mineral substances.

We can thus visualize the importance of the mineral industry to the *great state of California*.

During the year 1933 the world's production of gold amounted to 25,259,770 ounces or \$522,165,600 at gold par \$20.67, as compared to 24,135,296 ounces in 1932, or \$498,920,703 or an increase of 4.7 percent. (Value 1933 at \$35.00—\$883,091,950.00.)

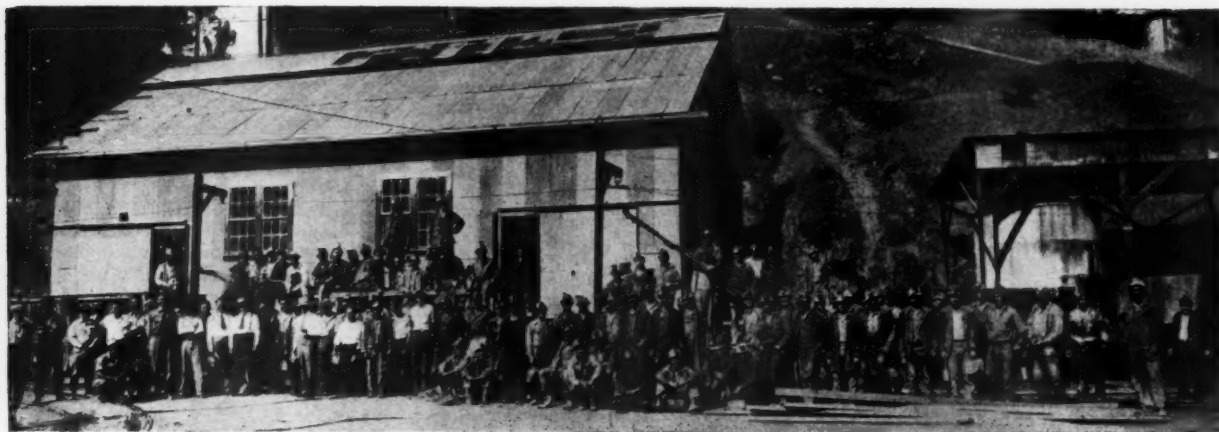
The increases occurred in Russia, Africa, Australia, Asia, and declines were in Canada, \$2,000,393; United

States, \$288,184 at \$20.67 per ounce. These declines in United States and Canada resulted largely from lower grade of materials than would have been possible to profitably mine and mill at the par gold price of \$20.67.

In 1920 when the cost of gold production reached the peak, operators were compelled to select the highest grade of ore in order to keep mines open and mills working, and even then most mining operations were forced to close down on account of the *excessive high cost of production, which was greater than the value of the product* at \$20.67 per ounce.

I am not going to discuss this phase of the gold problem as to gold and prices or its effects on monetary problems, however, in passing I do want to call your attention to the fact that gold had become a commodity in 1920, whose cost of production was greater than its monetary value at \$20.67, and the subsequent events in revaluation and gold embargoes may be laid largely to this reason, as it is clear that there existed nowhere in the world in 1920 gold fields which would yield a profit and produce sufficient gold for commercial and monetary uses at a price of \$20.67 per ounce. Now, the situation is reversed. Operators are able, with the prevailing gold price—\$35 per ounce in the United States of America, to mine and mill much lower grade material at a considerable profit, thus greatly enlarging the tonnage of gold ore reserves and creating a prospecting activity for new mines which exceeds anything heretofore known. Were it not for *plant capacity*, the world's gold production for 1933 would have been much greater.

(Concluded on page 35)



Mine Crew Coming Off Shift at Carson Hill Mine—Compressor House in Background

The Coming COAL CONVENTION and EXPOSITION

DISTRICT



H. C. Marchant



Rufus J. Ireland, Jr.



Jos. L. Osler

UNLESS all signs fail, the twelfth annual convention and exposition sponsored by the Coal Division, The American Mining Congress, May 13-17, Cincinnati, Ohio, will be the greatest success of all of the meetings arranged by this group.

Since early January an industry-wide committee has been at work developing a program designed to serve the need of the coal industry in meeting the problems occasioned by the higher wage scales, shorter working-day, and the necessity for greater efficiency in production methods.

Chas. F. Hamilton, vice president, Binkley Coal Company, Chicago, Ill., is national chairman of the program committee, and, with a committee of 77 operators, is responsible for the arrangements for the convention.

Geo. R. Delamater, assistant vice president, the W. S. Tyler Company, and a group of 47 manufacturers are responsible for the success of the exposition.

The Coal Division of The American Mining Congress, which is the official sponsor for this annual event, is under the direction of E. J. Newbaker, vice president, the Berwind-White Coal Mining Company, as national chairman, and a board of governors composed of the following representative coal men: R. L. Ireland, Jr., Hanna Coal Co.; S. B. Johnson, Lorain Coal & Dock Co.; A. J. Musser, Clearfield Bituminous Coal Co.; T. D. Lewis, Lehigh Navigation Coal Co.; Otto Herres, United States Fuel Co.; G. P. Bartholomew, American Smelting & Refining Co.; T. J. Fear, H. C. Frick Coke Co.; T. M. Dodson, Weston Dodson & Co.; T. J. Thomas, Valier Coal Co.; R. E. Taggart, Stonega Coke and Coal Co.; and L. N. Thomas, Carbon Fuel Co.

A special committee on arrangements will undertake to see that the convention moves smoothly and successfully. Maurice D. Cooper, Hillman Coal & Coke Co., is chairman of this group, and is assisted by the following men:

Committee on Welcome to Delegates: F. F. Jorgensen, Consolidation Coal Co.; Wm. E. Goodman, Goodman Mfg. Co.

Committee on "Open House Entertainment": L. N. Thomas, Carbon Fuel Co.; Frank E. Mueller, Roberts & Schaefer Co.

Committee on Annual Dinner: K. A. Spencer, Pittsburg & Midway Coal Mining Co.; E. A. Williford, National Carbon Co.

Prizes: Glenn E. Eddy, Ohio Brass Co.

Committee on "Our Gang Entertainment": W. D. Turnbull, Westinghouse Electrical & Mfg. Co.

Committee on "Visiting Ladies' Entertainment": Mrs. A. E. Bendelari and Mrs. C. L. Harrison.

CHAIRMEN



E. H. Wells



Moroni Heiner



F. S. Pfahler

Committee on Arrangements



F. F. Jorgensen



W. W. Dartnell



K. A. Spencer



L. N. Thomas



Glenn H. Eddy



M. D. Cooper
Chairman, Committee on
Arrangements



Frank E. Mueller



E. A. Williford



W. D. Turnbull



Wm. E. Goodman



Geo. R. Delamater
Chairman, Manufacturers Section



Chas. F. Hamilton
Chairman, Program Committee



E. J. Newbaker
Chairman, Coal Division

Committee on Attendance: W. W. Dartnell, Valley Camp Coal Co.; Geo. H. Morse, Union Collieries Co.

With such a distinguished group actively interested in the success of this meeting it could scarcely fail. The first preliminary program released March 22 gives ample promise that the meeting will be outstanding. It contains 55 papers on the liveliest topics before the industry. The exposition at this same date announces 102 participants, who will utilize practically the full capacity of Music Hall where both the convention and exposition will be held.

Among the topics announced are: Monday, May 13: Labor; Tipple Practice; Methods of Breaking Down Coal; Power Distribution; Problems of Management; Coal Processing. Tuesday, May 14: Various Methods and Processes for Cleaning Coal; Problems and New Things in Mining Strip Coal; Prevention of Coal Theft in Transit; Conveyor Loading; Face Preparatory Methods; Conveyor Mining Systems. Wednesday, May 15: Modern Mine Haulage Methods; Power Generation; Safety Programs; Modern Ventilation; Mechanical Loading; Screening; Dedusting. Thursday, May 16: Developments in Briquetting; Oil and Chemical Treatment of Coal to Improve Quality; Mechanical Mining Methods; Drainage Problems; Mine Maintenance; Refuse Disposal; Foreign Mining Methods.

An interesting session is being developed for Thursday evening and Friday morning, when the committee has determined to drop the practical operating discussions and enter the broader field of economic problems. Dr. C. K. Leith, vice chairman of the planning committee for mineral policy, National Resources Board, will present a statement on the purpose of his committee's recommendations for minerals, and a large number

of coal mining men, as well as producers of iron, copper, lead and zinc, have been asked to participate in the discussion which is to follow. Greater details of this part of the program will be announced shortly.

The topics that have been announced by the program committee include:

Effect of Shorter Working Hours on Costs; Human Engineering; Layer Loading for Uniform Product; Methods of Breaking Down Coal; Mechanical Loading Under Difficult Conditions; Power Distribution to Concentrated Mining Panels; Multiple Shifting; Anti-Freezing for Washed Coal at Tipple; High Points in Coal Cleaning in 1934; Cleaning Coal at the Delta Coal Mining Co.; A Portable Laboratory Coal Crusher; Cleaning Strip Coal; Evaluating Washed Coal; Water Clarification for Coal Washeries; Modern Truck Haulage in Strip Mines; Methods of Preventing Theft of Coal in Transit; Handling of Cars on Conveyor Loading; Cooperation Between Operator and Manufacturer on Equipment Design; Face Preparatory Methods, Covering Effect of Illumination, Cleaning at Face vs. Tipple, Cutting and Shearing for Mechanical Loading; Car Shifting Behind Mechanical Loaders; Shaking Conveyor Loading; Modern Main Line Haulage; Steam Generators; Time Clocks and Recording Injuries; Modern Mine Ventilation; Safety Programs; Safety in Mechanized Mining; Dedusting; Screening and Sizing; Recent Developments in Briquetting; Treatment by Oil or Chemical to Improve Quality; Mining System of Jewell Ridge Coal Corp.; Dewatering Mines; European Methods as Applicable to United States Production; Locomotive and Cutting Machine Maintenance; Outside Refuse Disposal; Future Outlook for Coal; Purpose of Planning Committee's Recommendations for Mining Industry.

Speakers who have definitely agreed to present papers and discussions are as follows:

J. A. Luse, Algoma Coal & Coke Co.
R. B. Gilmore, Knox Cons. Coal Corp.
Wesley S. Harris, Bicknell Coal Co.
Alder F. Castanoli, Koppers Coal & Transportation Co.
K. L. Marshall, U. S. Bureau of Mines.
R. R. Kirkpatrick, Standard Coal Co. of Utah.
James Hyslop, Walter Bledsoe & Co.
A. L. Lee, Consulting Engineer, Pittsburgh.
C. F. Keck, Jamison Coal & Coke Co.
D. D. Dodge, W. J. Rainey, Inc.
John H. Richards, Hanna Coal Co. of Ohio.
C. N. Templeton, Templeton Coal Co.
Newell G. Alford, of Eavenson, Alford & Hicks, Pittsburgh.
Merle Kelce, Sinclair Coal Co.
D. A. MacWhirter and O. O. Malleis, Appalachian Coals, Inc.
D. R. Mitchell, University of Illinois.
H. F. Hebley, Allen & Garcia Co., Chicago.
L. Russell Kelce, Hume-Sinclair Coal Co.
H. B. Husband, Fuel Department, Chesapeake & Ohio Railway Co.
M. A. Evans, CCB Division, Koppers Coal & Transportation Co.
H. M. Ferguson, Clinton Coal Co.
R. H. Morris, Gauley Mountain Coal Co.
Carel Robinson, Kelley's Creek Colliery Co.
M. H. Forester, Consolidation Coal Co.
P. L. Donie, Little Betty Mining Corp.
George B. Pryde, Union Pacific Coal Co.
W. W. Dartnell, Valley Camp Coal Co.
F. N. Becker, Jeddo-Highland Coal Co.
E. B. Agee, Youngstown Mines Corp.
Chas. W. Connor, Nellis Coal Corp.
H. S. Gay, The Gay Coal & Coke Co.

A. W. Hesse, Youngstown Sheet & Tube Co.

P. G. Conrad, Knox Cons. Coal Corp.

G. N. McLellan, Butler Cons. Coal Co.

J. E. Lee, Sheridan-Wyoming Coal Co.

Harry Hebenstreit, Standard Briquette Co.

P. F. Herrly, Panda Briquet Co.

D. Jamieson, Jr., Lincoln Coal Co.

O. B. Pryor, Elm Grove Mining Co.

Geo. A. Strunk, Old Ben Coal Corp.

Max Tuttle, Knox Consolidated Coal Corp.

E. Shriver, Raleigh Coal & Coke Co.

S. Austin Caperton, Slab Fork Coal Co.

E. R. Jobes, Valley Camp Coal Co.

Dr. L. E. Young, Pittsburgh Coal Co.

T. W. Gray, Pittsburgh Coal Co.

C. A. Gibbons, Susquehanna Collieries Co.

R. A. Suppes, consulting engineer, Charleston, W. Va.

Dr. C. K. Leith, vice chairman, planning committee for mineral policy, National Resources Board.

Members of the program committee are:

National Chairman: Chas. F. Hamilton, vice president, Binkley Coal Co.

State Chairmen:

F. S. Pfahler, president, Superior Coal Co.

H. G. Conrad, general superintendent, Knox Consolidated Coal Corp.

H. L. Warner, general manager, Kanawha & Hocking Coal & Coke Co.

J. L. Osler, Blackwood Coal & Coke Co.

T. W. English, The Consolidation Coal Co.

R. A. Suppes, consulting engineer, Charleston, W. Va.

Richard T. Todhunter, general manager, Barnes & Tucker Co.

H. C. Marchant, secretary-treasurer, Rocky Mt. Coal Mining Institute.

Albert Gately, general superintendent, Republic Coal Co.

E. H. Wells, president, New Mexico School of Mines.

Moroni Heiner, president, Utah Fuel Co.

R. J. Ireland, Jr., assistant to president, Owl Creek Coal Mining Co.

Members:

T. J. Thomas, president, Valier Coal Co.

Paul Weir, vice president, Bell & Zoller Coal & Mining Co.

W. J. Jenkins, president, Consolidated Coal Co. of St. Louis.

Carl T. Hayden, general manager, Sahara Coal Co.

T. C. Mullins, president, Northern Illinois Coal Corporation.

L. D. Smith, vice president, Chicago, Wilmington & Franklin Coal Co.

George C. McFadden, assistant vice president, Peabody Coal Co.

C. J. Sandoe, vice president, Pettery Coal Co.

George C. Campbell, vice president and general manager, Old Ben Coal Corp.

Carl Elshoff, president, Mine B Coal Co.

James Hyslop, electrical engineer, Walter Bledsoe & Co.

S. M. Cassidy, superintendent, Saxton Coal Mining Co.

P. L. Donie, vice president, Little Betty Mining Corp.

B. H. Schull, general manager, Binkley Coal Co.

Wesley S. Harris, president, Bicknell Coal Co.

H. M. Ferguson, president, Clinton Coal Co.

C. N. Templeton, general manager, Templeton Coal Co.

L. J. Lorms, assistant to president, Lorain Coal & Dock Co.

G. S. Jones, general manager, The Ohio Collieries Co.

Wm. P. Cayton, president and general manager, Rail and River Coal Co.

W. F. Hazen, general superintendent, Wheeling Township Coal Mining Co.

W. J. Borries, general manager, Dawson-Daylight Coal Co.

Harry LaViere, manager, South-East Coal Co.

W. W. Dartnell, general manager, Valley Camp Coal Co.

Geo. Dunglinson, Jr., manager, Fuel Department, N. & W. Railway Co.

Carl L. Hornor, president, Hornor Bros. Engineers, Clarksburg, W. Va.

S. Austin Caperton, general manager, Slab Fork Coal Co.

Carel Robinson, manager of mines, Kelley's Creek Colliery Co.

Garner Williams, vice president, Cabin Creek Cons. Coal Co.

Harry M. Moses, general superintendent, United States Coal & Coke Co.

A. S. Wilson, general manager, Boone County Coal Corp.

Wm. Beury, vice president, Algoma Coal & Coke Co.

Edw. Graff, general manager, The New River Company.

H. S. Gay, vice president and general manager, The Gay Coal & Coke Co.

Chas. W. Connor, general superintendent, Nellis Coal Corporation.

P. C. Graney, general manager, C. C. B. Smokeless Coal Co.

F. F. Jorgensen, manager of production, The Consolidation Coal Co.

L. C. Skeen, general manager, Fordson Coal Company.

R. H. Morris, general manager, Gauley Mountain Coal Co.

E. B. Agee, superintendent, Youngstown Mines Corporation.

Harold P. Tompkins, president, Tompkins Fuel Co.

H. B. Husband, general manager, Fuel Mine Operations, Chesapeake & Ohio Railway Co.

Geo. H. Morse, vice president, Union Collieries Co.

Robt. G. Pfahler, managing engineer, The Berwind-White Coal Mining Co.

C. W. Gibbs, general manager, Harwick Coal & Coke Co.

Thos. G. Fear, assistant to president, H. C. Frick Coke Co.

Dr. L. E. Young, vice president, Pittsburgh Coal Co.

D. D. Dodge, vice president in charge of operations, W. J. Rainey, Inc.

P. C. Thomas, vice president, Koppers Coal & Transportation Co.

H. L. Good, vice president, Westmoreland Coal Co.

Daniel Jamieson, Jr., superintendent, Lincoln Coal Co.

John C. Cosgrove, president, West Virginia Coal & Coke Corp.

L. H. Schnerr, division manager, Pennsylvania Division, The Consolidation Coal Company.

M. D. Cooper, division general superintendent, Hillman Coal & Coke Co.

C. F. Keck, safety director, Jamison Coal & Coke Co.

W. P. Vance, general superintendent, Butler Consolidated Coal Co.

A. W. Hesse, chief engineer, Youngstown Sheet & Tube Co.

A. B. Kelley, treasurer and general manager, Humphreys Coal & Coke Co.

Newell G. Alford, vice president, Eavenson, Alford & Hicks, Pittsburgh.

H. H. Bubb, general superintendent, Cokedale Plant, American Smelting & Refining Co.

D. R. Swem, manager of coal operations, Northwestern Improvement Co.

K. A. Spencer, vice president and manager, The Pittsburg and Midway Coal Mining Co.

Otto Herres, assistant manager, United States Fuel Co.

I. N. Bayless, assistant general manager, Union Pacific Coal Co.

Manufacturing companies who have exhibits on the floor are:

Ahlberg Bearing Company.

Alemite Sales Company.

Allen-Sherman-Hoff Company.

American Brattice Cloth Co.

American Car & Foundry Co.

American Cast Iron Pipe Co.

American Sheet & Tin Plate Co.

American Steel & Wire Co.

American Telephone & Telegraph Co.

Atlas Powder Company.

Bethlehem Steel Company.

Brown-Fayro Company.

Carnegie Steel Company.

Chicago Pneumatic Tool Co.

Cincinnati Mine Machinery Co.

Coal Mine Equipment Sales Co.

Coal Mining.

Columbia Alkali Corp.

Deister Concentrator Co.

The Deming Company.

Duncan Foundry & Machine Wks, Inc.

DuPont de Nemours & Co., Inc., E. I.

Duquesne Slag Products Co.

Edison Storage Battery Co.

Electric Railway Equipment Co.

Electric Railway Improvement Co.

Electric Storage Battery Co.

Enterprise Wheel & Car Co.

Flood City Brass & Electric Co.

Fafnir Bearing Company.

General Electric Company.

General Explosives Corporation.

General Steel Castings Corp.

Goodman Manufacturing Co.

Gulf Refining Company.

Hazard Wire Rope Company.

Hendrick Manufacturing Co.

Hercules Powder Company.

Hockensmith Wheel & Mine Car Co.

Hulbert Oil & Grease Co.

Irwin Foundry & Mine Car Co.

Jeffrey Manufacturing Co.

Joy Manufacturing Co.
 Kanawha Manufacturing Co.
 Koppers-Rheolaveur Company.
 LaBour Company, Inc.
 La-Del Conveyor & Mfg. Co.
 Lehigh Safety Shoe Company.
 Leschen & Sons Rope Co., A.
 Lorain Steel Company.
 Link-Belt Company.
 Macwhyte Company.
 Mancha Storage Battery Locomotive Co.

McGraw-Hill Publishing Co.
 McNally-Pittsburg Mfg. Co.
 Miner Co., W. H.
 Mine Safety Appliances Co.
 Morrow Manufacturing Co.
 Myers-Whaley Company.
 National Carbon Co., Inc.
 Natl. Malleable & Steel Castings Co.
 New Departure Manufacturing Co.
 Nordberg Manufacturing Co.
 Norma-Hoffman Bearings Corp.
 Ohio Brass Company.
 Penn Machine Company.
 Pennsylvania Electric Repair Co.
 Phillips Mine & Mill Supply Co.
 Portable Lamp & Equipment Co.
 Post-Glover Company.
 Princeton Foundry & Supply Co.
 Prox Company, Frank.
 Pure Oil Company.
 Republic Steel Corp.
 Roberts & Schaefer Co.
 Robins Conveying Belt Co.
 Robinson Ventilating Co.
 Roebeling's Sons Co., John A.
 Safety Equipment Service Co.
 Safety First Supply Co.
 Safety Mining Co.
 St. Louis Power Shovel Co.
 Sanford-Day Iron Works, Inc.
 S K F Industries, Inc.
 Standard Oil Co. of Indiana.
 Streeter-Amet Company.
 Sullivan Machinery Co.
 Texas Company.
 Tide Water Oil Co.
 Timken Roller Bearing Co.
 Toledo Scale Company.
 Tool Steel Gear & Pinion Co.
 Tracy Company, Bertrand P.
 Tyler Company, The W. S.
 Tyson Roller Bearing Corp.
 U. S. Bureau of Mines.
 Universal Lubricating Co.
 Utility Conveyor & Mine Equipment Company.
 Watt Car & Wheel Company.
 Weir Kilby Corp.
 Westinghouse Electric & Mfg. Co.
 West Virginia Rail Co.
 Wood Preserving Corp.

Special attention is to be given to the entertainment of the visiting ladies. Mrs. A. E. Bendelari, wife of the president of the Eagle-Picher Lead Company, and Mrs. Charles L. Harrison, social leader of Cincinnati, will serve as joint hostesses. These two ladies accepted this responsibility at the 1934 meeting and were such a success that they were unanimously urged for a "repeat performance," to which they have kindly consented. The entertainment so far planned includes a schedule that will guarantee the ladies a wonderful time, with a tea at Mrs. Harrison's lovely



L. W. Shugg
 Director of Exhibits

home and a special picnic luncheon at a famous Cincinnati estate, Mrs. Bendelari, hostess.

The occasion of the annual dinner will be a unique one, which may be termed "A Night of Magic," and the management plans a real surprise and an innovation in dinner entertainment. Exhibitors will put on one of their old-fashioned "Our Gang" nights, which consists of amateur performance by exhibitors' representatives.

ARTHUR ROEDER, trustee of the Colorado Fuel and Iron Company, announced on March 13, that the company had filed with Judge J. Foster Symes, of the United States District Court in Denver, a proposed plan of reorganization under the new Section 77-B of the Bankruptcy Act providing for corporate reorganizations. The reorganization plan provides for the creation of a new company whose capitalization will consist of \$4,500,000 of existing funded debt to be assumed by the new company, \$11,053,200 of 5 percent income mortgage bonds maturing in 1970, 552,660 shares of common stock and warrants for the purchase of an aggregate of 315,379 shares of common stock at \$35 per share on or before February 1, 1950.

WHILE 1934 was not as favorable in the fatality rate per million tons of coal produced in the United States as was 1933, a few of the coal mining states had fewer fatalities in 1934 than in 1933. Indiana did a good job in reducing its coal mine fatalities from 38 in 1933 to 10 in 1934, and in neither year had an explosion disaster. Other states having fewer coal mine fatalities in 1934 than in 1933 were: California, 1 to 0; Kansas, 10 to 8; North Dakota, 6 to 5; Ohio, 54 to 44; Texas, 2 to 0; Utah, 11 to 9; and Washington, 6 to 4. Tentative figures place the number of fatalities in our coal mines in 1934 at 1,151 against 1,064 (final figures) in 1933.

THE U. S. Bureau of Mines has issued the following publications: (1) final statistics on coke and by-products for 1933; and (2) such preliminary statistics on coke production in 1934 as have been compiled, showing the 1934 production of by-product coke as 30,833,110 tons, which is an increase of over 4 million tons over the previous year's production. The 1933 and 1934 production of beehive coke were 911,058 tons and 997,100 tons, respectively. Copies available upon request.

J. W. FINCH, director of the Bureau of Mines, has announced the appointment of 28 men to confer and advise with the Bureau on problems relating to their respective industries.

The group will be dollar-a-year men. A meeting will be held about April 1.

The men appointed are: Axtell J. Byles, president, American Petroleum Industries Committee; Amos Beatty, Phillips Petroleum Company; W. R. Boyd, Jr., American Petroleum Industries Committee; Harvey C. Fremming, International Association of Oil Field, Gas Well and Refinery Workers of America; J. C. Coulter, International Association of Oil Field, Gas Well and Refinery Workers of America; Howard N. Eavenson, consulting engineer, Pittsburgh; Louis C. Madeira, III, executive director, Anthracite Institute; Lewis E. Young, vice president, Pittsburgh Coal Co.; Cadwallader Evans, Jr., Hudson Coal Co.; Eugene McAuliffe, Union Pacific Coal Co.; D. S. Hanley, Washington, representing Western Coal Producers; John L. Lewis, A. D. Lewis, William Green, representing mining employees; Thomas H. Brown, International Union of Mine, Milling & Smelting Workers; Cleveland E. Dodge, Phelps-Dodge Corp.; H. A. Guess, American Smelting & Refining Co.; Frank M. Smith, Bunker Hill and Sullivan Mining Co.; Otho M. Graves, National Crushed Stone Association; C. K. Leith, National Resources Board Mineral Policy Committee; Howard I. Young, American Mining Congress; Julian D. Conover, American Mining Congress; Thomas M. Girdler, American Iron & Steel Institute & Republic Steel Corp.; Frank L. Chase, ex-president, American Gas Association; J. D. Creveling, advisory council, American Gas Association; J. Thompson Brown, E. I. Du Pont de Nemours (explosives); John T. Ryan, Mine Safety Appliances Co.; E. D. Bullard, E. D. Bullard & Co.

THE SLATE sold at the quarries of the United States in 1934 was approximately 229,000 short tons valued at \$2,615,000, according to preliminary figures compiled from data furnished by slate producers. This was a decrease of 12 percent in quantity and 3 percent in value from the output for 1933—259,620 short tons valued at \$2,696,185.

The roofing slate sold in 1934, amounted to 138,800 squares valued at \$1,028,000. This represented a decrease of 9 percent in quantity but a gain of 6 percent in value over the figures for 1933—153,170 squares valued at \$967,834.

Of all things...

Every Congress likes to appropriate money. . . . But none of them more than the present Seventy-fourth Congress. . . . When it comes to appropriating, this one is probably going to set a new record. . . . Even the war Congresses may go down in history as paltry and picayunish appropriators in comparison. . . . The \$4,880,000,000 "gravy train," as it was termed by one exasperated Senator, was the largest single appropriation ever made at one time in the history of the world—so far any one knows. . . . And that includes King Midas and his fabulous horde of gold. . . .

It's going to be different when pay day comes around. . . . Answering Huey Long who said taxes ought to be levied to pay for the appropriation, Virginia's Carter Glass probably hit the nail on the head. . . .

Asked Mr. Glass: "Does not the Senator (Long) know the Wagner-Costigan anti-lynching bill has not as yet passed?"

Answered Mr. Long: "What has that to do with this matter?"

Answered Mr. Glass: "The Senator knows very well that if the Senate were to impose NOW the taxes necessary to meet the current indebtedness of the United States, all of us would be lynched before we would get back home."

We'll bet that the day after the Congress passes a bill to investigate investigating committees, Gabriel will blow his horn. . . .

It costs the people of the United States five million dollars a year to make laws that they either try to evade or promptly forget all about. . . .

The Senate Finance Committee subjected Donald Richberg to some sharp questioning about the worth and value of the NRA. . . . One thing they didn't ask—and for which he was probably mighty thankful—was about Miss Ida Erler's stomach trouble. . . . Five months ago Miss Erler's employer in Minnesota asked the NRA for a code exemption so that she could take an hour and a half for lunch instead of an hour because her stomach trouble wouldn't permit her to gulp her lunch hastily and hurry back to work. . . . A short time ago the employer got word back from the NRA that a special exemption of the code had been granted him and it was all right to let Miss Erler have an hour and a half for lunch. . . .

But in the five months that it took for the ponderous NRA machinery to function, in the five months that the application went from code officer to administrator to legal department to NRA Board, etc., etc., Miss Erler had to go right on gulping her lunch.

There's going to be a lot of congressional sympathy for Miss Erler's stomach just as soon as some Congressman hears about it. . . .

Washington is already speculating about "Senator" Hugh Johnson, of Oklahoma. . . . Cloakroom gossip has it that the dynamic ex-poultry man of the Blue Eagle is a certain candidate. . . . What a mixup that would bring about. . . . Johnson would run against the conservative incumbent, blind Thomas Gore, a very lukewarm New Dealer, particularly lately. . . . If that happens Louisiana's Huey Long has already told the boys he would get into the battle on both feet—on the side of Gore. . . . Long, who says the President isn't radical enough aiding a Senator who has sharply criticized the Administration as being too radical. . . . But that wouldn't bother Long. . . .

The one who would be most pleased of all about the setup would be James Aloysious Farley. . . . What sweet revenge it would be to help back Johnson against anti-Roosevelt Gore, especially if Gore had Long's active support, and more especially, of course, if Johnson won. . . .

Incidentally there comes whisperings that by the time the next campaign rolls around it will no longer be Postmaster General James Farley—just plain Chairman of the National Democratic Committee Jim Farley. . . .

And what a Senate the Seventy-fifth Congress would have with Huey Long and Hughie Johnson as Senators! . . . Standing room in the galleries would be at a premium. . . . it is now when Huey takes the floor. . . . And talking about the public debt, the Administration is passing up a good thing in not selling admission to the galleries. . . . At 50 cents a ticket (dirt cheap for some of the performances) and a standing guarantee that Long will take the floor at least once a day (that would probably require an understanding with Huey and a possible split on the gate) the Treasury ought to realize a minimum of \$400 a day. . . . At five days a week for six months—Oh well, you can see the possibilities. . . .



Wheels of

Government



WHILE the legislative calendar is crowded to overflowing and Congressional committees are still buried deep with hearings on various measures, there appears to be an easing of the situation that has confronted Congress for the past six weeks. Legislation is taking form, committees are reporting measures, and the impasse reached with the blockade of the Work Relief Bill has been bridged as it has emerged from the legislative jam. The Administration's hope for other impounded legislation is again revived and considerable action is in evidence.

Meanwhile, an impatient and critical public has deluged Congress with protests of various kinds. Congressional mail, which has been exceedingly heavy since the opening of this session, reached an all-time peak this month. All those "for" and all those "against" proposed legislation have been exceedingly active in making their views known. Legislators have been swamped, and some have resorted to the expedient of the penny postcard for acknowledgments which advised constituents that their views would eventually receive the legislators' attention. The full impact of business discouragement has been levelled at Congress, and the protests against all kinds of restrictive legislation have been steadily growing louder.

In the midst of this confusion and haste, talk of adjournment is already in evidence. About the first of May Congress begins to think seriously about going home, and the desire to get back to the old home town may have considerable pressure upon the present legislative tie-up.

History is daily in the making, and never has that history been more important. The battle between those for and against the program advanced by the union labor group is daily writing into our historical record tenets that may far outlive any of the contestants.

A major item to come from committee with favorable recommendations is the 30-hour bill providing for the 6-hour work-day. Another is the Guffey-Snyder coal control bill which has received commendation from the sub-committee to the general committee which has it under consideration. Hearings are now being conducted upon the Wagner labor dis-

putes bill, with industry generally appearing against it. It is probably the most far-reaching and important legislation proposed at this session, which seems to have been setting all kinds of records. The battle of the utilities has waxed hot. The President went so far as to send a special message to Congress on this subject, and that is not a usual procedure. Labor has lost the hard fought battle for "prevailing wage" demand, but is making a desperate effort to make up any of that loss through the Wagner bill.

Some Washington commentators are of the opinion that Congress is headed toward the restoration of the anti-trust laws. This is a subject of vital importance to industry and is involved intricately in the future of the National Industrial Recovery Act. Fifty-two Senators opposed the proposal to turn NRA over to the Federal Trade Commission, although the majority believe that something must be done to change the "blue eagle."

Whether Congress is guided by it remains to be seen, but there is no question but that it is conscious of a steadily growing momentum of public opinion against Government in business; share-the-wealth plans, old age pensions, and kindred proposals that would make Congress the All-Protective-Agency. As an interesting trend Chief Justice Charles Evan Hughes, and two Associates from the Supreme Court, appeared before the Senate Judiciary Committee in opposition to proposed legislation involving Federal agencies. The committee in question is considering the Black bill to permit direct appeals to the Supreme Court in injunction or restraining order cases involving Government departments or bureaus.

While at this writing (March 26) the press is full of threat of nation-wide strikes in all branches of industry on April 1, which would involve coal, and other natural resources, a coordinated campaign has been launched in high administration and labor circles to see that this threat does not become a reality. Press reports indicate that the plan shows likelihood of success and

considerably more effectiveness than the "truce" negotiated under the NRA. There has been much discussion, and no little conjecture as to the Administration's attitude toward labor legislation, many commentators holding tenaciously to the thought that a "trade" had been made and that the Administration would sponsor such legislation as the Wagner bill; other commentators are definitely of the opinion that such is not the case, and that the Administration's chief object is to keep the wheels of industry moving, even if slowly, until the NRA can acquire a new dress.

The status of legislation, as reported by the special Legislative Bulletin Service, The American Mining Congress, is as follows:

S. 87—*Black 30-Hour Week Bill*. Committee on Judiciary. Bill reported favorably and on Senate calendar.

S. 1417—*Coal Industry Control*. Committee on Interstate Commerce. Bill still in committee. Ultimate disposition dependent on consummation of wage and working agreement between operators and miners. (Present wage scale extended until June 16 by agreement effective March 30.) Also upon NRA bill now in Finance Committee.

Outstanding changes in committee print of bill as reported by sub-committee are: (1) expression "regulated as a public utility" changed to "regulated as herein provided." All reference to the industry as a public utility eliminated from the bill. (2) National Bituminous Coal Commission increased from five to nine; five to be impartial; two producers; two employees. (3) District tonnage allocations determined on basis of 1934 production, instead of the average of 1919 to 1934, plus 1934. (4) Upon exhaustion of a mine the code member operating shall be entitled to open a new mine in the same producing field to retain benefit of his existing tonnage quota or quotas. (5) In negotiating hour and wage agreements, a vote of more than two-thirds (instead of one-half) of the annual national tonnage, together with vote of more than one-half of the workers required to make applicable to all code members. (6) In the national coal reserve section, Secretary of the Interior now authorized to acquire coal properties by condemnation proceed-

ings as well as by purchase. Also authorized to acquire not merely "lands containing bituminous coal deposits suitable for mining" but coal mines, coal properties, coal lands, mining rights, leaseholds, royalties, and any interest in coal and lands containing bituminous coal deposits suitable for mining." Tax to provide for purchase of coal lands now reads: for 1935, 4 cents per ton; for 1936, 7.3 cents per ton; for 1937, 8.7 cents per ton; for 1938, 6.9 cents per ton; for 1939 and succeeding years until the bonds are retired, 3.21 cents per ton.

S. 1476—*Government to Mine Gold and Rare Minerals*. On Senate calendar. Senator Wheeler (Dem., Montana), has introduced the following amendment: "On page 6, between lines 2 and 3, insert the following: (f) The Director is further authorized to repair old roads and construct new roads to mining camps wherever it may be necessary for carrying out the purposes of this Act."

S. 1632—*Transportation Acts—Water Carriers*. Committee on Interstate Commerce. Under consideration by committee.

S. 2199—*Reasonable Regulation of Competition in Trade*. Nye (Dem., North Dakota). Committee on Finance. Provides that it shall not be unlawful for persons to cooperate by written agreement for the reasonable regulation of competition in trade. Authorizes Federal Trade Commission (1) to approve or disapprove agreement in whole or in part; (2) to supervise the effect of said agreement in operation; (3) to declare as unfair competition any practice or method which may be condemned as unfair when signed by substantial number engaged in any branch of industry or trade when such a practice or method may exist or which may be affected thereby and (4) at any time, upon due notice, in the public interest, to abrogate said agreement in respect to any provision therein which the Federal Trade Commission may deem to be contrary to the maintenance of fair competitive conditions based on sound economic principles.

S. 2211—*"Equal Rights Trading Act"*—Bankhead (Dem., Alabama). Committee on Judiciary. Directed at Pittsburgh plus method. Authorizes Federal Trade Commission to enforce as in section 11 of the Act entitled "An Act to supplement existing laws against unlawful restraints and monopolies and for other purposes," approved Oct. 15, 1914. Prohibits persons engaged in commerce from quoting a price other than the price at the place where goods are manufactured or shipped unless purchaser requests price quotation at destination. Also prohibits adding to shipping point price of goods, a charge for delivery to a destination which is other than the actual cost of delivery, through such agency as the buyer shall specify. Identical to H. R. 6188, Huddleston (Dem., Alabama).

S. 2245—*Government to Mine Gold and Rare Minerals*—McCarran (Dem., Nevada). Committee on Mines and Mining. Similar to S. 1476, Pope (Dem., Idaho), now on Senate Calendar. Di-

P. S. WITH LOVE AND KISSES FROM FLORIDA!



—Washington Daily News

rector of U. S. Bureau of Mines authorized to engage in operation of mines, or any processes necessary to the mining, milling, or processing of gold, silver, and/or all other non-competitive or deficiency minerals on Federal lands; also on privately owned property by agreement with the owners and through payment of royalties which shall not exceed 50 percent of the net operating profits. Selection of officials and employees on basis of merit and efficiency. Seventy-five million dollars to be provided for work from Federal relief funds. Does not specifically authorize construction of smelters, refineries, etc. Does not specify payment of "prevailing rate of wage." Does not contain specific declaration as in Pope bill that "it is the policy of Congress to avoid competition with the existing mineral industries."

S. 2232—*Repealing Foreign Trade Agreements and Authority Therefor*—McCarran (Dem., Nevada). Committee on Foreign Relations. Identical with H. R. 6366 Scrugham (Dem., Nevada).

S. 2424—*Bureau of Mines Experiment Station, Salt Lake City*—King (Dem., Utah). Committee on Mines and Mining. Provides for the establishment and maintenance of a central research and experiment station. Differs from S. 393 by same author (Leg. Bull. No. 1) by terming the proposed station a "central" research and experiment station, and by arranging for the transfer of the power, records, property, personnel and appropriations of the present Salt Lake station only. Appropriates \$50,000 for 1936 and annually thereafter.

Note: The bill includes inquiries and investigations into oil, gas and hydrocarbons, which are specifically excluded in H. R. 2853, Murdock (Dem., Utah).

S. 2427—*Erect and Operate Custom Mills*—McCarran (Dem., Nevada). Committee on Mines and Mining. Identical with H. R. 4010, Scrugham (Dem., Nevada). See Leg. Bull. No. 4.

S. 2445—*Extension of NRA*—Harison (Dem., Mississippi). Committee on Finance. Reenacts Title I of NIRA

with extensive amendments, for period of two years, or to June 16, 1937. Continues existing codes 90 days after expiration of present Act; no code to continue beyond such 90 days without review and approval by the President. Codes limited to industries engaged in or affecting interstate and foreign commerce as broadly defined. Section 7(a) continued without change. President to have power to impose limited codes, containing requirements as to maximum hours, minimum wages, collective bargaining, child labor, prohibition of unfair business practices, waste of natural resources, and furnishing of information to Government agencies. States "The maximum hours provided for in any such limited code shall not be less than — hours nor more than — hours per week; except that when it is found necessary, overtime work in excess of the prescribed maximum, to be paid for at the rate of time and one-half may be provided for in such code."

Reference to natural resources also made in Section 1(c) authorizing and directing President to take action under the law "when he finds that such action is necessary and proper in the public interest and in accordance with any of the following limitations and standards: That such action . . . Conserves natural resources, and prevents production or competition wasteful of such resources and injurious to commerce therein." Also in Section 3(a)(5) which prohibits "devices for fixing prices or controlling production or distribution which are restrictive of fair competition; but devices for controlling prices, production, or distribution may be applied . . . to those trades or industries which are now or hereafter subjected to governmental regulation of prices, services, and methods of operation, as public utilities, or as natural resource industries (such as, among others, coal, oil, or gas), or because they are found to be affected with a public interest."

H. R. 6980—*Amending Section 3(e) (Import Restrictions) of NIRA*—Jenkins (Rep., Ohio). Committee on Ways and Means. Amends as follows: "The term 'substantial quantities' as used in this subsection, shall be interpreted to mean such quantity or quantities of importations from any foreign country which is in excess of 10 percentum of the quantity of the domestic production of any article or articles with which the imported article or articles compete; the 10 percentum of domestic quantity shall be based on the average annual production determined over a five-year period from 1929 to 1934; all importations from any country in quantity greater than 10 percentum of the average domestic production of similar goods is prohibited."

H. R. 6993—*Limiting Entry of Foreign Goods*—Connery (Dem., Massachusetts). Committee on Ways and Means. Limits importations competitive in the American market where "landed costs" are less than costs of production and delivery of comparable American goods. To be administered by Secretary of Treasury. All imports must be accompanied by sworn statement that total

"landed costs" are not less than American costs of comparable goods. Section 3 provides that on complaint of representatives of workers employed in American production or mining, Secretary is authorized to refuse entry to such foreign goods until after he has made an investigation and ascertained that total "landed costs" were not less than production costs of comparable American articles.

H. R. 7121—*NRA Extension*—Doughton (Dem., North Carolina), Committee on Ways and Means. Identical with S. 2445.

H. R. 6649—*Immigration Quota—Mexico and Philippine Islands*—Kramer (Dem., California). Committee on Immigration and Naturalization. Amends section 4(c), Immigration Act of 1924 by striking from the list of countries not subject to quota restriction "The Republic of Mexico." All provisions of the immigration law relating to numerical limitations made applicable to persons born in Canada, Newfoundland, Mexico, Cuba, Haiti, Dominican Republic, Canal Zone, and in any independent country of Central or South America. Annual quota to be 30 percent of visas issued year ending June 30, 1930, provided that quota for Mexico shall not exceed 1,000. Philippine Islands to have quota of 50.

H. R. 6808—*Immigration Quota, Mexico and Philippine Islands*—Kramer (Dem., California). Committee on Immigration and Naturalization. Differs from H. R. 6649, by same author, by repealing, instead of amending, Subdivision (c) of Section 4 of the Immigration Act of 1924, as amended; thus eliminates the classification of "non-quota" countries.

H. R. 6958—*Prohibiting the Importation of Copper*—Hook (Dem., Michigan). Committee on Ways and Means. Prohibits importation or withdrawal from bond for consumption or use in the United States or any of its possessions except the Philippine Islands, the Virgin Islands, American Samoa, and the Island of Guam of copper in any form. Further provides that when the President finds that "copper ore" in the United States shall have maintained a price of 20 cents per pound for 30 days on the New York market he shall so proclaim and from date of proclamation embargo shall be inoperative. A duty of 15 cents per pound of copper content shall then be levied.

H. R. 6188—*Equal Rights Trading Act*—Huddleston (Dem., Alabama). Committee on Interstate and Foreign Commerce. Identical with S. 2211, Bankhead (Dem., Alabama).

H. R. 6266—*Government to Mine Gold and Rare Minerals*—Scrugham (Dem., Nevada). Identical with S. 2245, McCarran (Dem., Nevada).

H. R. 6223—*Interior Department Appropriations Bill*. In Senate Committee on Appropriations, and will be heard about April 1. Dr. Eugene McAuliffe, chairman, Committee on Bureau of Mines for the American Mining Congress will present the desires of the mining industries at the hearing. This will

	House Bill	Pope Amendment	Increase
General Expense	\$ 62,190	\$ 62,190	No change
Operating Mine Rescue Cars and Investigations of accidents	499,000	669,000	170,000
Testing fuel	110,400	210,400	100,000
Mining Investigations	128,860	288,860	160,000
Oil and Gas Investigations	122,866	222,866	100,000
Mining Experiment Stations	145,450	195,450	50,000
Pittsburgh and Bruceton Stations	67,690	87,690	20,000
Economics of Mining Industries	262,855	275,855	13,000
Helium Investigations	18,000	18,000	No change
Total	\$1,417,411	\$2,030,311	\$613,000

be supplemented by special statements by J. D. Conover, secretary, American Mining Congress; J. D. Collett, president, Mid Continent Oil and Gas Association; J. D. Battle, Executive Secretary, National Coal Association, and others. This bill provides \$613,000 increase Bureau of Mines appropriation as above.

Senator O'Mahoney (Dem., Wyoming) has introduced the following amendment: "For the establishment, equipment, and maintenance of a petroleum experimental station at Laramie, Wyoming, in cooperation with the University of Wyoming, \$40,000 to be immediately available."

H. R. 4142—*Lewis-Doughton Economic Security Act*. Committee on Ways and Means. Still under advisement in committee.

H. R. 6359—*Repealing Publicity of Income Tax Returns*. Passed Senate March 28 and sent to conference because of amendment by Costigan (Dem., Colorado) providing for availability of returns to state and local tax officials. Expect acceptance by both Houses and approval soon. The repeal of Section 148(d) was not considered on the floor of the Senate in connection with the repeal of Section 55(b).

H. R. 6450—*Labor Representatives on Federal Boards*. On Union calendar.

H. J. Res. 117—*Emergency Appropriations Act—1935*—(\$4,880,000,000 Relief Bill). Passed Senate March 23 and now in conference. Anticipated that Conference Committee will report at an early date and that bill will quickly become law.

H. J. Res. 146—*State Compacts Affecting Labor and Industries*. On House calendar.

AMONG pertinent subjects which came up for consideration in the State Legislatures are:

ALABAMA: Rule by the people on all questions, including prohibition, the state fee system now in vogue in many counties, the right to recall unsatisfactory officials, and exemption of the Tennessee Valley Authority from control of the State Public Service Commission is advocated by Governor Bibb Graves.

CALIFORNIA: Governor Frank F. Merriam is on record as opposing the scheduled drop from 2½ to 2 percent in the state sales tax; legislation to retain the present rate, or possibly to raise the rate, will be offered. Farm interests are advocating an income tax capable of raising 12 millions annually; possible sources of revenue are being canvassed. Governor Merriam is against resort to the authorized levy of an ad valorem tax up to 25 percent of budget needs which might yield 66 millions. In the budget is an estimate of 15 millions for relief.

COLORADO: Tax increases are anticipated.

ILLINOIS: Use of a 9-million surplus in the state treasury which will have accumulated by April 1, as a result of administration economies and success of the retailers' occupation tax, to meet demands for unemployment relief, is advocated by Governor Henry Horner. He urges delay, however, in other relief appropriations until the Federal relief program is determined. Approving the principles of unemployment insurance and old-age pensions, he suggests that state legislation wait on Federal enactment.

IN THE DISCARD



—The Washington Post

IOWA: Use of profits from state sales of liquor for payment of old-age pensions in Iowa is advocated by Governor Clyde L. Herring.

KANSAS: The legislature is expected to adopt a sales tax to augment state revenues.

MARYLAND: To provide 8 millions for relief and to cover an anticipated deficit of \$2,229,000, the legislature is expected to find new revenues.

MASSACHUSETTS: Governor James M. Curley asks legislative action to provide: Liberalization of laws in the interests of labor; state cooperation with the Federal Government in relief administration; increase in income tax to relieve property owners of excessive tax burdens; prosecution of tax delinquency, and other measures.

MINNESOTA: Larger levies on incomes and inheritance are contemplated. The Citizens' Committee on Public School Finances proposes administrative modernization and reorganization of "an antiquated taxing system" as a means of providing adequate educational facilities in the State.

MISSOURI: Governor Guy B. Park asks that the present sales tax of one-half of 1 percent be doubled, and recommends postponement of consideration of proposals for old-age pensions. He states added revenues are needed to meet the cost of relief for "unemployables" abandoned by the Federal Government.

MONTANA: Consolidation of counties as an economy measure is advocated by taxpayers' organizations in Montana; a measure drafted for legislative consideration would eliminate all counties with taxable value of less than 5 millions, reducing the number from 56 to 28 or 29 counties.

NEBRASKA: Governor Roy L. Cochran asks the Legislature to strike the gold clause from all public and private contracts entered into in the state. The legislation proposed, and immediately drafted for action, provides for payment of debts "in any lawful money of the United States with the same number of dollars" a person contracts to pay plus interest not in excess of the maximum legal rate. More rigid regulation of utilities is to be considered. To provide additional revenue, the possibilities of a sales tax and of an income tax will be explored.

NEW HAMPSHIRE: A limitation written into the state law brought unemployment relief in New Hampshire to an end on December 1, last. Retiring Governor John G. Winant has pointed out the hardships resulting from this situation and has urged immediate legislative remedy. Governor-elect H. S. Bridges is expected to recommend specific relief legislation.

NEW JERSEY: Governor Harold Hoffman urges reform in procedure to expedite legislation. The administrative council proposes reform in administration of emergency relief embodying a system of unemployment; sickness and accident insurance; division of costs between state and county of old-age pensions, women's and children's care, and other general relief agencies; economies in municipal, county and state governments preliminary to any levy of new taxes to provide relief funds. Governor Hoffman proposes a 2 percent sales tax to raise 20 millions annually and an income tax capable of producing 15 millions annually. He aims to reduce the tax burden on real estate, relieving it of the 2.75 mill state school tax amounting to 18 millions. He also plans removal of the soldiers' bonus tax of \$900,000 yearly and absorption by the state of the old-age relief assessment against counties.

NEW MEXICO: State legislature will consider whether county government reorganization will provide economy and efficiency. New sources of revenue probably will be tapped.

NEW YORK: Unemployment insurance, ratification of the proposed child labor amendment to the Federal Constitution, restriction of workmen's compensation insurance for all except self-insurers to the state compensation fund, advancing to 16 from 14 years of age at which children may leave school to go to work, regulation of home work in industry, minimum wages and hours of labor are on the legislative schedule of Governor Herbert H. Lehman.

NORTH DAKOTA: Governor Thomas H. Moodie desires to relieve the state of a Federalized status and place it back in the class of states controlling relief funds. To raise the state's quota of relief funds resort may be made to either a sales tax or an income tax.

OHIO: Governor-elect Martin L. Davey will propose reorganization of relief administration and enactment of a \$75,000,000 permanent taxation program to compensate for a loss of 45 millions of property taxes.

OKLAHOMA: A one-year emergency recovery program has been submitted to the Oklahoma legislature by Governor E. W. Marland. Drastic increase in taxes is asked to finance the plan. Sales taxes would be increased from 1 to 3 percent and gasoline taxes from 4 to 5 cents. A severance tax of 2 cents per 1,000 cubic feet on gas production for one year also is proposed. Emergency taxes on cigarettes, incomes, salaries, rentals, insurance premiums, and inheritances, to be covered into the general revenues, are on the Governor's card. One of the methods proposed to carry out the recovery program is the creation of a new indus-

tries board to bring new industries into the state. It is estimated that 7½ millions will finance these recovery agencies for the year ending July 1, 1936.

PENNSYLVANIA: In connection with the problem of raising millions for unemployment relief, a special committee of the legislature has been considering methods of raising funds; income, personal, occupation, and sales taxes, and increase in gasoline and other existing taxes have been studied as to revenue possibilities. There is talk of increasing the gross receipts tax on corporations. Pennsylvania must raise \$178,600,000 to balance the budget. Adoption of a new organic law is considered essential by the new administration for carrying into effect the New Deal policies.

RHODE ISLAND: A complete program of social legislation, including ratification of the pending child labor amendment to the Federal Constitution and laws on minimum wages, unemployment insurance, old age pensions, and revision of the workmen's compensation laws has been advanced by Governor Theodore Francis Green.

TENNESSEE: Laws to carry into effect recommendations for land use made by the State Planning Board will be sought. A sales tax to provide needed revenue is suggested.

TEXAS: Governor James V. Allred plans a survey of the State's industrial possibilities with a view to increasing employment and stabilizing the economic system. Utility legislation is anticipated; the state has undertaken the development project on the Colorado River, and laws are proposed to make it possible for any community to acquire and operate its own utilities.

UTAH: Shift of the tax burden from property by substitution of income, sales, business, inheritance, liquor, and other taxes will be proposed to the legislature by taxpayers' organization.

WEST VIRGINIA: A revised state recovery measure proposed for enactment provides for removal of obstructions to the free flow of commerce; for elimination of unfair labor conditions and competitive practices; for promotion of capacity production in industry; for reduction of unemployment; for improved labor standards; and for rehabilitation of industry and conservation of natural resources.

WYOMING: To meet the state relief problem, Governor Leslie A. Miller asks that counties share with the state on a 50-50 basis the costs of administration. A half million reserve in the general fund may be utilized in an effort to avoid heavy taxation. A selective sales tax is also considered a possible source of revenue.

FOR the convenience of our readers, we present herewith a short statement concerning the leaders in the Senate and House.

OFFICERS OF THE SENATE

JOHN NANCE GARNER, born Red River County, Tex., November 22, 1869. Admitted to bar, 1890. Married Ettie Rheiner, 1895. Member Texas House of Representatives 1898-1902. Member 58-72 Congresses inclusive (1903-33) from 15th Texas district. Delegate Democratic National Conventions 1900 and 1904. Delegate at large 1916. Elected Speaker of House of Representatives 1931. Elected to 73rd Congress but resigned. Elected Vice President of the United States November, 1932. *President of the Senate.*

KEY PITTMAN, born Vicksburg, Miss., September 19, 1872. Attended Southwestern Presbyterian University, Clarksville, Tenn., and George Washington University. Practiced law in Seattle, Wash., from 1892. First prosecuting attorney, Nome, Alaska. Went to Tonopah, Nev., 1902. Elected U. S. Senate for unexpired term of four years in 1912. Re-elected 1916, 1922 and 1928. Secretary committee on platform and resolutions of Democratic National Convention, 1924; chairman committee on platform and resolutions of Democratic National Convention, 1928; elected President pro tempore of Senate, March 9, 1933; appointed by President as delegate to Monetary and Economic Conference held in London, June, 1933. *Present President pro tempore of Senate.*

JOSEPH TAYLOR ROBINSON, born Lonoke, Ark., August 26, 1872. Educated public schools, graduated University of Arkansas. Admitted to bar, 1895. Elected General Assembly of Arkansas, 1894. Elected to 58-62 Congresses, inclusive. Inaugurated Governor of Arkansas, 1913. Elected to U. S. Senate, January, 1913. Re-elected 1918, 1924, 1930. Served as chairman of Minority Conference, 1922-1933. *Chairman of Majority Conference.*

CHARLES L. McNARY, born near Salem, Ore., June 12, 1874. Educated public schools in Salem and Stanford University. Dean of Willamette College of Law, 1908-13. Associate Justice of Oregon Supreme Court, 1913-14. Appointed to fill unexpired term of Sen. Harry Lane ending 1918; appointed to fill unexpired term of Hon. F. W. Mulkey, ending 1919. Elected 1918 for six-year term; re-elected 1924; re-elected 1930. *Minority leader of Senate.*

EDWIN ALEXANDER HALSEY, born Nelson County, Va., 1881. Attended Locust Dale Academy, Virginia and Virginia Polytechnic Institute. Appointed colonel

on staff of Gov. William H. Mann, Virginia, 1910. Elected sergeant at arms of Democratic National Committee in 1928. Employee of Senate since 1897; 16 years in press gallery. Married. *Elected Secretary of Senate March 9, 1933.*

OFFICERS OF THE HOUSE

JOSEPH W. BYRNS, born July 20, 1869, Cedar Hill, Tenn. Graduated law department Vanderbilt University, Nashville, Tenn. Three times elected member lower house of Tennessee Legislature. Speaker of lower house state legislature, 1899. Elected to Tennessee Senate, 1900. Elected to Sixty-first to Seventy-third Congresses, inclusive. Chairman of Democratic National Congressional Committee. Elected majority leader of Seventy-third Congress. *Elected Speaker of the House of Seventy-fourth Congress.*

WILLIAM B. BANKHEAD, born April 12, 1874, Moscow, Ala. Graduated University of Alabama, A.B., 1893; Georgetown University Law School, LL.B., 1895. Served in state legislature, 1900-1901. City attorney of Huntsville, Ala., four years. Circuit solicitor, fourteenth judicial circuit, 1910-14. Elected to Sixty-fifth to Seventy-fourth Congresses, inclusive. *Elected majority leader to Seventy-fourth Congress.*

BERTRAND H. SNELL, born Colton, N. Y., December 9, 1870. Attended public schools until 1884. Graduated from State Normal School, Potsdam, N. Y., 1889. Entered Amherst College fall of 1890, graduated 1894; LL.D., 1929. Director New York Trust Co., Watertown, N. Y.; director Gould Pumps, Inc., Seneca Falls, N. Y.; president, board of trustees, Clarkson College, Potsdam, N. Y. Delegate to and permanent chairman, Republican National Convention, Chicago, 1932. Elected to Sixty-fourth to Seventy-fourth Congresses, inclusive. *Minority leader of House.*

SOUTH TRIMBLE, born Hazel Green, Wolfe County, Ky., April 13, 1864. Attended public schools Frankfort, Ky. Graduated Excelsior Institute. Elected to Kentucky House of Representatives, 1898 and 1900; Speaker of the House the last year. Elected to Fifty-seventh, Fifty-eighth, Fifty-ninth Congresses. Democratic nominee for lieutenant governor of Kentucky, 1907. *Elected Clerk of National House of Representatives for Sixty-second, Sixty-third, Sixty-fourth and Sixty-fifth Congresses, and again in Seventy-second, Seventy-third and Seventy-fourth Congresses.*

IN THE transfer of power and skill from the individual to the machine, a new set of circumstances enters into the technique of management, according to Bernard Lester, Assistant Industrial Sales Manager of Westinghouse Electric and author of the only book on marketing industrial equipment. The three principal problems formerly existing—maintenance of labor discipline, training the worker in skill, and instituting in-

centives for increased production—were all intended to extract maximum labor power. Management today, however, has another set of conditions to face. Idleness of the worker is serious, but idleness of the machine is of even greater importance because it stops production, distribution, and use of the product, which involves a whole line of workers beyond those employed by the manufacturer.

"With these changed conditions due to more and costlier machinery, management's job has become essentially that of planning. The problem of 'what to do and how to do it' has been largely solved, but it has been replaced by the problem of 'when should it be done and where.' Means of production have been attained, but the order and control of production remain a difficult problem." In a new book—the first to be published on the subject, Mr. Lester, with his background as a lecturer at the University of Pittsburgh presents a thorough and authoritative analysis of the problems involved in distributing machinery and equipment which forms so large a share of the durable goods market.

Today the approach to the problem of selling must change with the altered conditions in industry. Machinery per se is of no interest to the manufacturer. What is of interest is what the use of the apparatus will do in helping an overall profit for the operator. In these times the treasurer or financial head of the purchasing company has a more vital interest in determining the outlay for new machinery and equipment. He must be shown that for a definite allotment of funds there will be a definite return, and that this return must pay for the outlay in a definite and relatively short period of time even when the plant operates upon a restricted schedule as to volume of production.

Conditions affecting future obsolescence of machinery and equipment to be installed present vital problems. More than half the machinery and equipment installed today is obsolete. With the rapid progress that has been made in the direction of improved machinery, it becomes obsolete in most instances long before it actually wears out.

In discussing this subject, Mr. Lester finds that "competition in all forms of trade has reached the point where it is no longer constructive but positively destructive. Great progress in economical and controlled distribution will come through a popular realization of the folly of 'price selling' and 'price buying.' Wisdom through experience, will show sales executives the foolishness of continuing to sell lines of products which are unprofitable. Our minds must be trained to refuse unprofitable business with enthusiasm. Modern manufacturing and the costs of production have in the past been studied much more closely than the methods and costs of distribution. There are great possibilities in the study of selling methods and procedure, and until this is done in the field of industrial marketing to a much greater degree in the future than in the past, waste through misapplied effort will continue."

Commercial Production of Metallic Beryllium

By EDGAR R. LARSEN*

BERYLLIUM having such a great affinity for oxygen, has been heretofore a serious problem in reduction to the metallic state. On the other hand this great affinity for oxygen makes Beryllium an extremely effective deoxidizing agent when added to other metals.

After ten years of constant research there has been developed a process to produce metallic Beryllium as well as the compounds. The compounds are produced by improved standard practice. The process in reduction of the compounds to the metallic state has not been made public.

A pilot plant with a capacity of 200 pounds a day of the metal was built some months ago. Considerable work has been done in our Laboratories in testing the metal and making alloys. The cost of production is rather low and the process has been simplified to such an extent that the cost of the metal will be brought down to a reasonable price.

With Beryllium in sufficient quantities, alloys can be made to make steel tools and rock drills which never require re-sharpening; armour-plate that can be shattered but not pierced by shell-fire; new high grade artillery; tremendously strong dirigible frame-works; copper instruments with the tensile strength of steel and many other new devices.

Beryllium-aluminum alloys may prove a decisive factor in our national defense. Airplanes constructed with these alloys will have approximately twice the tensile strength of ordinary steel and having but one fourth the weight of steel; giving a greater carrying capacity and much greater speed with the same relative horse-power as now used. High speed trains now coming into vogue can be made with these alloys where lightness in weight and high tensile strength is required. With the advent of streamlines in the automobile it is highly possible that an automobile can be built with much less than half the present weight. There is no appreciable thermal expansion of Beryllium-Aluminum alloys.

Metallic Beryllium may be electroplated upon copper, nickel, iron, aluminum and alloys of the light metals. By keeping the bath at proper temperature, and subsequently heat-treating the de-

posited metal it is possible to obtain an alloy of Beryllium with the underlying metal, resulting in firmly adherent castings having the properties of respective Beryllium alloys.

A few one hundredths of 1 percent of phosphorus, heretofore most commonly employed as a deoxidizer, cause a marked decrease in the electrical conductivity of the copper, on the other hand 0.01 to 0.02 percent Beryllium which combines with nearly twice its weight of oxygen, is an excellent deoxidizer for high conductivity of copper castings. Besides the high conductivity, the castings are dense, smooth and flawless. In other words the conductivity of ordinary cast copper may be raised by as much as 20 percent. When Beryllium is employed for this purpose it is added in the form of an alloy with copper, containing 10 percent Beryllium castings of smaller cross-section and low weight are thus produced.

The melting point of aluminum is lowered but little by additional Beryllium since the composition of the eutectic lies at only 1.4 percent Beryllium. Upon further additions of Beryllium the temperature at which solidification begins rises very rapidly, with only 8 percent Beryllium. It is 1000 degrees centigrade.

There is no difficulty in preparing Beryllium aluminum alloy castings of any composition. It is also possible to secure flawless rolled sheets (down to thickness of 0.1mm) from cast alloys containing Beryllium up to 75 percent, the highest percentage that has been investigated. The rolling is either done cold, with occasional annealing at 600° centigrade or hot at 600° to 650° centigrade.

In many cases Beryllium bronzes will undoubtedly be employed because of the greater reliability, even though the initial cost is higher.

A bright commercial future is to be predicted for Beryllium bronzes. They are already used for springs possessing a peculiar mechanical and chemical resistance and showing very slight fatigue phenomena. The Beryllium bronzes will also find application in the construction

of air-craft and ships, as, for example, in the suspension-springs of air-plane landing gear where special strength is required to withstand the heavy shocks that often occur during landing. The high resistance of the bronzes to corrosion and erosion renders them suitable for pumps, liquid meters, turbine blades and the like. They may be substituted with advantage wherever aluminum phosphor-bronzes have hitherto been employed and developed noticeable weakness. In contrast with castings of aluminum-bronze those of Beryllium bronze show complete freedom from oxides, a greater density, and a greater strength at high temperature which is often an important property.

Alloys of Beryllium with nickel or cobalt as well as the three metal systems beryllium-copper-nickel, beryllium-copper-zinc and beryllium-copper-aluminum possesses similar useful properties.

Alloys of iron, chromium, nickel and beryllium show not only a chemical resistivity corresponding to that of V2A-steel (18 percent Cr. 8 percent Ni.) but excellent hardness, strength and elasticity. It has been found possible to produce beryllium-steels, without adding carbon, that have an appreciable residual magnetism. When the binary beryllium-steels are annealed, they resemble silicon-steel. According to kroll, iron alloys, composed of 12 percent Cr., 5 percent Ni., and 1 percent beryllium, attain the temper of speed steel after aging. An alloy of 20 percent Cr. 7 percent Ni. and 1 percent beryllium behaves like temperable V2A-steel, while an alloy of 36 percent Ni. with 1 percent beryllium resembles invar-steels, combining good resistance to the atmosphere with considerable strength after tempering.

Physical properties of a cast Beryllium-Cu. of 2 1/4 % Beryllium are given as follows: Ultimate tensile strength 110,000-120,000 lbs./in.²; yield point 85,000-90,000 lbs./in.² Brinell hardness 375-400. Electrical conductivity 32-35% of standard annealed Cu., thermal conductivity about same relative to Cu. as electrical conductivity. Beryllium-Cu. alloys can be die-cast without difficulty and have somewhat better properties. Beryllium has a good deoxidizing effect on Cu.-castings.

(Concluded on page 35)

* Metallurgist, Beryllium Alloys Co., Inc.

CONVEYOR SYSTEM

At BARNESBORO MINES

By C. P. BRINTON *

THE Barnes Coal Company installed a system of belt conveying at its No. 15 mine, Cambria County, Pa., in September 1931. The main gathering belt conveyor when fully extended is 1,400 ft. in length, troughed type 26 in. in width with a forward and backward running speed of 100 ft. per minute, with a forward carrying capacity of 90 tons per hour. The belt is of Jeffery construction 52B, which is sectional, the lengths of belt to be added or taken off being 90 ft.

Rooms are driven to the right and left of the main belt conveyor heading as shown on descriptive drawing. The rooms are necked and reach full width at 40 ft., and it is in full width rooms, namely, 45 ft. wide, that we have made the time study. We work two seven-hour shifts known as the day and night shift. We do not attempt to work the clean up system, but the men take week about working night shift.

The advancing face cycle begins with the starting of the cut along one of the faces and will be tabulated as first phase of operation requiring a certain time to complete, namely, a certain number of hours and minutes as shown.

The 15 items concludes the actual face advancing cycle of cleaning up a 45-ft. width cut, the cycle in man hours being 13 1/6—the net tons in a cut being 30 tons. A study of the coal section is necessary before a workable understanding of the above man hour cycle

	Man Hrs.	Man Min.
1. To cut face with (35 B bottom cutter)	35
2. To pull up machine, sump and drawback	19
3. To load out machine slack while cutting	35
4. To clean slack from under the cut	24
5. To drill eight holes (no filing of augers)	13
6. To prepare and tamp eight holes	34
7. To set safety props (3 or 4)	9
8. To add pan and adjust chain room conveyor	57
9. To move face conveyor and adjust	13
10. To set the regular timbers (6 props)	10
11. To inspect place and shooting	16
12. To pick boney, shovel back gob and build back wall	3	13
13. To pick dirt during the loading of cut	15
14. To load out the cut	5	..
15. To take down frozen boney and square face	20

is clarified. One of the characteristics being that the top coal is termed as frozen to the boney which usually carries to a depth of between 1 to 2 1/2 in. When shooting the coal, suffi-

cient explosive must be used to dislodge and break up the 10 in. of boney, and is the cause for item (12). This also causes added dirt to the coal in the nature of fines. We are using up 24 percent of the man hour cycle in performing work that should not be necessary.

Referring to a discussion of the cycle which upon studying different man crews in the same section of the mine, the 13 1/6 man hour cycle represents an average. This checked against the actual time of 4 hours 22 minutes that it took the three man crew to complete the work in one of the rooms studied.

The crews are shifted from one face to another, if in the opinion of the assistant foreman the section need be advanced faster than some other. The crews share equally in the tonnage from this main belt section.

(a) By reducing the cutting phase of the cycle to a percent of the total 35 minutes equals 4.4 percent of cycle represented by item No. 1.

(b) Considering items Nos. 2, 3, 4, as bearing a close relation to No. 1, the time required being 78 minutes or 10 percent of the cycle time.

(c) Passing to items No. 5 and 6, the drilling which is done by an electric drill and tabulated as item No. 5 consumes 13 minutes, but by adding No. 6 requires a total of 47 minutes or 6.0 percent of the cycle.

(d) Grouping items 8 and 9 the extending and moving of conveyors, it required a total of 70 minutes or 8.8 percent of the cycle.



Figure 1

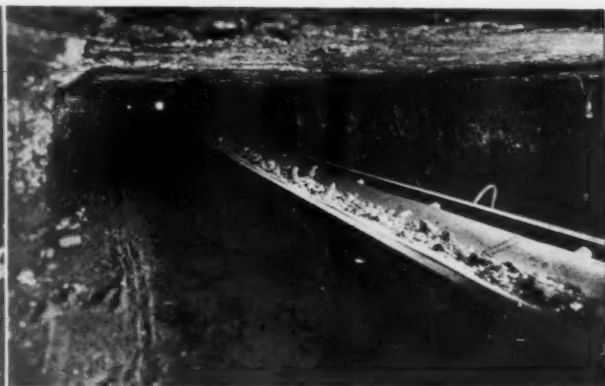
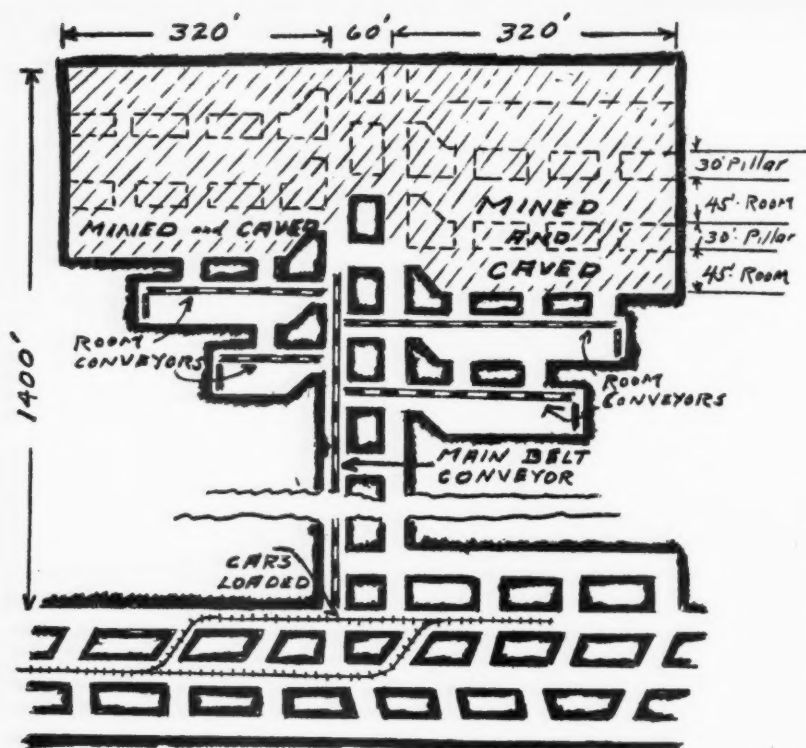


Figure 2

* Engineer, Barnes & Tucker Co.



Mining Plan

(e) For timbering grouping items 7 and 10 the total time was 19 minutes or 2.4 percent of the cycle.

(f) This item No. 12 has previously been referred to and consumes 24 percent of the cycle.

(g) In grouping items 13, 14, 15, we have the largest percentage of the major phase of the cycle 335 minutes equalling 42.4 percent.

(h) Taking item 11 which deals with the shooting and inspecting of the place 16 minutes or 2.0 percent of the cycle time.

Under paragraph headings from (a) to (h) inclusive the major phase operations of the cycle are grouped and proportioned.

The main belt loading point is shown in Fig. 1. By an inspection of the photograph it will be noticed that the top of the rail on the haulage heading is below the bottom on which the main conveyor drive base is anchored, and which is also the bottom immediately under the coal seam. A slight depression is shot out of the roof over the loading or discharging end of the main belt. Bottom is taken up to provide clearances of a minimum of 5 ft. over the rail. The mine cars are moved past the loading point by means of a hoist located out by on the heading as shown on descriptive drawing.

In Fig. 2 the main belt is shown. In this view you will notice the importance of transverse leveling and of longitudinal alignment. This view also shows the careful installation of the electrical

equipment on the out by the right rib side of the conveyor heading. It can be seen by looking at the rib that the coal is taken to the seam bottom.

The view shown in Fig. 3 is the tail of the belt. The inclined jacks are used to anchor the tail end to maintain tensioning in the belt, and proper alignment. The view shows accumulations of fine coal which is scraped off the return strand of the belt.

In referring to the view shown in Fig. 4 a room conveyor is set up to discharge on to the main belt. The room unit head end is set on timbers, the timbers being placed upon the floor immediately under the coal seam. The roof is not disturbed at the room discharge loading points. The almost perfect alignment of the main belt is quite noticeable. At the room discharge loading points, we do not provide loading hoppers, which would ease the coal upon the belt in the direction of travel of the loaded belt. The fact that the belt is reversed to haul supplies, mostly timbers, does not permit of the use of loading hoppers.

The face conveyor shown in Fig. 5 is the goose neck type. However we have now attempted to standardize on the Jeffrey H.G. type without the goose neck.

Other operations are necessary to the working of the unit as a whole, but not directly chargeable to individual cycles. The advancement of O. B. Junction Box panels which are moved up about 50-ft. advancement intervals, about ten minutes is required to move the box, hang cables, and ground same.

The time the main belt is reversed for hauling supplies to the room necks varies

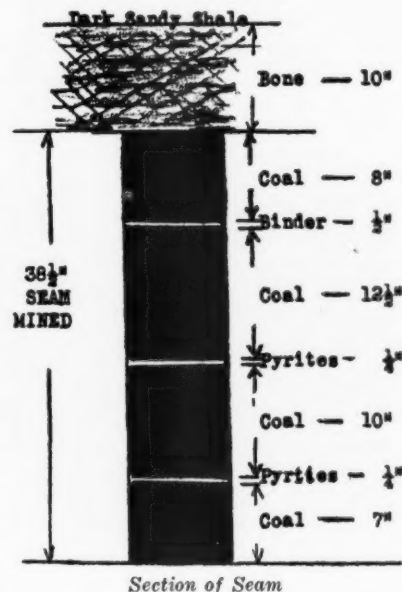
according to the distance the room necks are away from the loading end of the main belt. At present we move 40 props in one half hour for a distance of about 1,100 ft.

The length of time the room conveyor units are reversed also depends on the distance the room is up, 10 minutes a shift.

In moving a room conveyor unit from one room to another a distance of 150 ft., it takes three men six hours each or 18 man hours.

The time required to add 450 ft. of the main belt was 35 hours, four men working. The time required to take off 200 ft. of the main belt was 12 hours, four men working. Servicing of the main belt, greasing and inspecting rollers by the assistant foreman, 21 hours every six weeks. Part of the unit is serviced each day—for servicing the room conveyor units five minutes per shift.

The drawing of the 30-ft. pillars does not allow of the same distinct operations in each case. After the 45-ft. room is driven up, a cross cut about 15 ft. in width is driven through the pillar, this cut through is at right angles to the finished room and allows the pillar to be worked open ended. On drawing the different steps of the pillar removal is shown, the first cut along the open is made and loaded out on the face conveyor, then the second and third and so on until the roof begins to show signs of breaking which usually is between the 9th and 12th cuts. The place is carefully timbered, a double row of posts being placed along the rib line of the caved room. The same number of posts is used in the pillar area as in the room area. Being able to tell when the fall will occur, four additional posts are set. This system allows us to control the line of break quite satisfactorily.



After the first cave is made a 10-ft. base triangular shaped pillar is left when the next 15-ft. cut through is made. This cut through is aimed so that when the pillar rib is reached, the protecting pillar is brought to a point and then is drawn back. The next step is to leave another protecting pillar and repeat the methods as described until the room pillar has been removed. We figure that the average tonnage per man on pillar work is one-third less than on room work. We are apt to get the first fall at about 60 ft. after the first pillar cave. The tonnage per crew is reduced, due to the confined working space and the extra safety precautions that are necessary.

The elevations shown on the drawing are taken on the bottom in the conveyor headings and are top of rail elevations on the haulage heading.

The electrical installations within the belt panel heading is of the permissible type. For the control and signal

systems, switches are conveniently placed and a telephone and bell are used for signaling.

An exhaust system of ventilation is used, the panels being on separate splits. The stoppings between the headings are fire-proof construc-

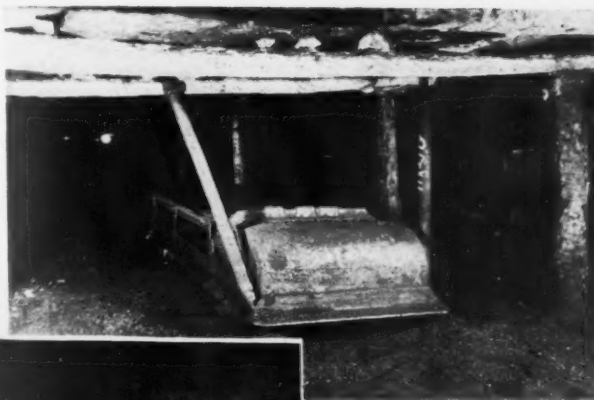


Figure 3

is the Lower Kittanning B or Miller seam. Some of the average characteristics of the different bench heights are shown on drawing. The roof is good and can be controlled to suit this system of mining. Our coal recovery is increased, our safety hazard of handling of mine cars is eliminated, the cost of heading and room yardage is done away with, track cost and haulage is reduced. The



Figure 4

tion, while the room cross cuts are canvas. Line brattices are used between last room cross cut and the face. A flame safety lamp is kept at the working face.

The seam of coal being mined

concentrated workings mean more economical results.

The above review describes the methods our company is following in conveyor loading. We know it is far from perfect and we will gladly receive constructive criticism. In any system of conveyor loading, local conditions are the most important factors in the selecting of methods of operation.



Figure 5

THE United States Bureau of Mines announces that, for the first time, mechanical methods of concentration have been applied successfully to potash ores. The experimental work was carried out on material from Carlsbad, New Mexico, containing about 40 percent potassium chloride, the valuable mineral, and 60 percent sodium chloride. Over 96 percent of the potassium chloride in the original material was recovered in a concentrate containing 95 percent KCl and only 5 percent extraneous matter.

The new development, part of which was conducted in cooperation with the Potash Company of America, is a mechanical rather than a chemical process. High-grade concentrates were made with good recoveries by any one of three methods: tabling and flotation; tabling an agglomerated feed, supplemented by flotation; and all flotation.

Any system of gravity concentration, such as jigging or tabling, depends on the difference in the specific gravity, or unit weight, of the minerals involved. Thus galena with a specific gravity of 7.5 can be separated from quartz, specific gravity 2.65, with ease. However, the two minerals in the New Mexico potash ore offer quite a different problem; sylvite (KCl), specific gravity 1.99, must be separated from halite (NaCl), specific gravity 2.15. The closeness of these gravities (0.16) heretofore had defeated any attempts to apply mechanical methods to the separation.

To make gravity separation possible, the Bureau utilized the fact that there is more difference in the relative weights of these two minerals in a saturated brine than in pure water. Furthermore, both sylvite and halite are unaffected by brine, although dissolved by water. Hence

all tabling was carried out in a circulating brine.

Best results were secured if the ore, prior to tabling, was treated with crude oil and an additional reagent. By such treatment the potassium chloride particles were coated with oil, while the sodium chloride was unaffected. The oiling accelerated the gravity separation, in fact, the capacity of the tables for an oiled feed was double that for untreated ore.

Details of this work are given in Report of Investigation 3271, "Concentration of the Potash Ores of Carlsbad, New Mexico, by Ore Dressing Methods" by Will H. Coghill, F. D. DeVaney, J. Bruce Clemmer and S. R. B. Cooke. Copies of this publication can be obtained by writing to the Bureau of Mines in Washington, D. C.

CONVEYOR MINING

By L. H. SCHNERR *

DURING the last few years many operators have been forced to some kind of mechanized mining in order to remain in the coal business. In the low veins such as are prevalent in the Central Pennsylvania field, the tendency has been towards the installation of conveyor units, as such units seem to fit the conditions encountered better than other forms of mechanized mining.

At the recent meeting of the Mining Institute of America held in Pittsburgh, the question was asked—"Which is the best conveyor?" If some one had been able to answer that question, it would have been followed probably by—"What is the best system of conveyor mining?" Of course, no one attempted to answer the first question, and some heated arguments were prevented. The type of conveyor and the system in which it should be used depends entirely on the peculiar natural conditions found in that particular operation, and upon the attitude and aptitude of the man-power available. It might be added further that the success of the installation is dependent at the very beginning on the interest and enthusiasm of the mine officials; beginning at the top.

All coal operators are now more or less familiar with the several main types of conveyors and so it is unnecessary to go into detail on this subject, except to say that the writer will endeavor to confine his thoughts to the steel chain-flight type of conveyor most common in the Somerset District.

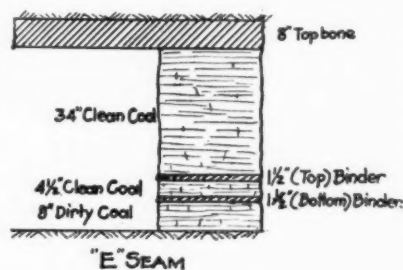
The principal reasons for picking the chain-flight type conveyors in Somerset County were the heavy adverse grades and the large quantity of water prevailing generally. Of course, late developments in the belt type and shakers may result in inroads on the chain-flight type of equipment. Aside from this, any combination of these is possible.

After the conveyors have been introduced and the seemingly natural opposition by the men wears off, and they realize they are in to stay, the operator gradually goes from the most simple set-ups to the more complicated set-ups which to him seem desirable for better and cheaper production within the possibilities of his natural conditions. The writer's own company has done this very thing and has experimented with several types of equipment and a number of systems more or less complicated in one way or another. The result of these experiments has been to standardize gen-

erally on what the writer believes to be one of the most simple systems possible, and, to date, the one which has proven to be the most successful for our peculiar conditions.

For the first example allow me to take an operation in the Upper Freeport or "E" Seam (nongaseous) which has the seam section as indicated in Sketch No. 1.

In all conveyor places except haulageways, the cutting is done in the upper or



Sketch No. 1

1½-in. binder, and the cuttings either gobbled or loaded out as refuse. The coal remaining above this binder is then loaded as merchantable coal, keeping the top bone in place by a standard system of timbering. In order to shoot this coal properly, a very light electric coal drill is furnished and the holes are drilled as horizontally as possible in the coal just below the top bone. We do not attempt to recover any of the four and one-half inch bench of coal. Being good coal, it makes a good bottom on which to load off the upper portion of the seam. Cutting in the upper binder and discarding same also improves the size of our product by the omission of cuttings in the merchantable coal. The extra height is also a distinct advantage.

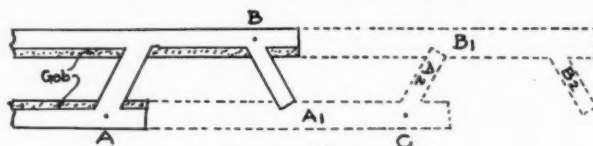
Each conveyor crew has one man designated as the leader. This leader is invariably the cutter. He is the man whom the management holds responsible for the efficient organization of his crew which results in efficient operation of the conveyor units. It is this team work headed by the leader that has made conveyor mining successful.

During the introduction of conveyors, the crews were paid by the hour, but due to the lack of incentive, nothing worthy of mention was accomplished. In fact under that system the machinery was known to be purposely broken down to make the work easier. When the tonnage rate was introduced, the whole picture changed. At the same time, the idea of having a designated leader was also introduced, and we are still in doubt what degree of credit is due to each of these two changes. So far as we are able to determine, they are of equal importance.

The leader is given a bonus of one cent per ton in rooms and two cents per ton in headings on all tonnage produced by his particular crew. This is to compensate him for his leadership and his responsibilities in regard to safety, preparation of coal and proper care of equipment. The leader also arranges for the proper supply and handling of explosives, which are paid for equally by the entire crew.

ENTRY DRIVING

In advancing haulageways, the cutting is done in the bench of dirty coal next to the real bottom. These cuttings are loaded out as dirt and the coal shot as usual, except a little more powder is necessary to break down the two binders. The entire 34-in. portion of the seam is then loaded off the top binder, which is hard enough to make a good shoveling surface, before the scrapping of the "bottoms" begins. The top bone is kept



Sketch No. 2

in place for later consideration. The disposal of this top bone will be explained when we consider our system of entry advancement.

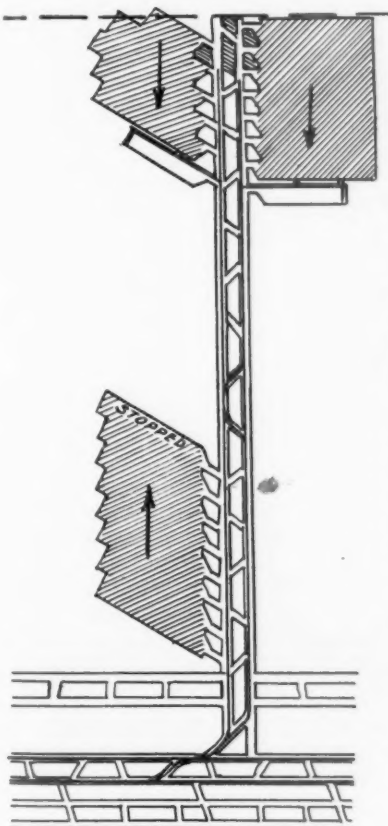
The "E" seam being considered in this region as a nongaseous seam gives us the opportunity to work rooms off of each entry of the pair of butt or room entries. The system illustrated in Sketch No. 2 is used. Beginning with the entries driven as shown by the solid lines, we set up our main conveyor at point A. Previous to this time, the permanent butt heading track has been laid up to point A and a temporary curve thrown into the

* Division Manager, the Consolidation Coal Co.

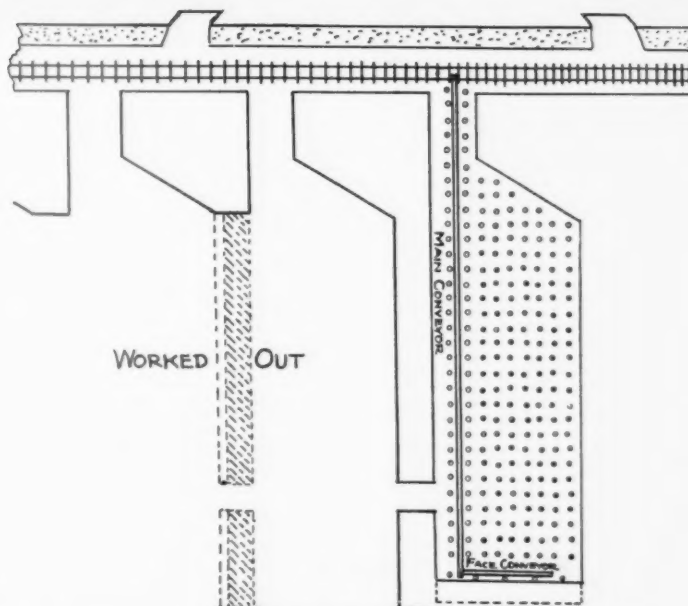
left hand chute at that point, to handle the necessary number of empties to load out a complete cut. The conveyor loading begins and the entry is driven just three cuts past the future loading point C. On the way, however, fresh air is met when the intersection is made with the chute opposite point B. At point C, the chute designated as A2 is made by means of an auxiliary conveyor and this set-up is then complete.

The conveyor is then moved so that it will load at point B and the same procedure carried out as at point A. However, while the conveyor is loading at point B, a track crew has advanced the track in the opposite heading from point A, with its temporary curve in A2. Furthermore, the top bone is then shot down on top of the newly laid track and the portion not needed for ballast is gobbed as these butt headings are driven 18 ft. wide, leaving six feet open for gobbing purposes. The result of this system is that you need a minimum amount of conveyor equipment and your conveyors are continually on coal which in itself keeps down the maintenance cost of such equipment. The "heading crews" are made up generally of four men including the boom man.

After the top bone has been removed, we have a clear height of almost five feet which we have found to be sufficient for room headings. Our main headings are brushed from 12 to 24 in. higher, depending on where we find a satisfactory smooth plane.



Sketch No. 4



Sketch No. 3

The entry conveyor unit consists of the following equipment:

- 1 —300' Main Conveyor
- 1 — 50' Cross Conveyor
- 1 Shortwall Cutting Machine
- 1 Electric Coal Drill
- 1 Blower Fan (To hasten removal of powder smoke.)
- 1 Slo-speed Hoist
- 1 Standard Switch-board Panel
- Necessary cables, etc.

ROOMS

Our rooms are driven 40 ft. wide on 50-ft. centers as shown in Sketch No. 3. The room crew consists of four or five men including the boom man.

When the room has been driven to its limit, which is from 275 to 300 ft., slabs 7 ft. deep and roughly 40 ft. long are removed from the theoretical 10-ft. pillar, the main conveyor being shortened after each slab is taken. The pillar coal is loaded directly on the main conveyor as the face conveyor has then been removed. Once a pillar is started, it is promptly finished. The time needed is generally one 24-hour day.

If the room pillar shows any weight, the cutting is done in the good coal just above the top binder. The reason for this is to keep any dirty machine cuttings from mixing with the merchantable coal, which would result if it became impossible to remove such cuttings thoroughly.

The room unit equipment is the same as an entry unit except the room unit has a low face conveyor instead of the cross conveyor.

Our room crews usually complete a room (including pillar) in 12 working days of two shifts each.

The chain pillars and room stumps behind the conveyors are removed by pick mining. By means of a small hoist, these pick men are able to handle their own cars from the supply put in for the conveyors.

The mine under discussion is located in the basin with an average over-burden of approximately 250 ft. in which there are two heavy beds of sand rock. The top rock immediately above the seam is usually a black slate; however, this is sometimes either soap-stone or sand rock.

Perhaps due to a peculiar set of circumstances we are able to obtain a fair concentration in spite of our one-room set-ups. We have found from experience that we must "anchor" our room headings as soon as possible by driving a pair of rooms and removing the intervening pillar at the bottom of such entries. If this caving chamber idea is not carried out, we find ourselves in trouble both in the headings and in the mains. However, once our room headings are "anchored" we can expect no further roof trouble under normal roof conditions.

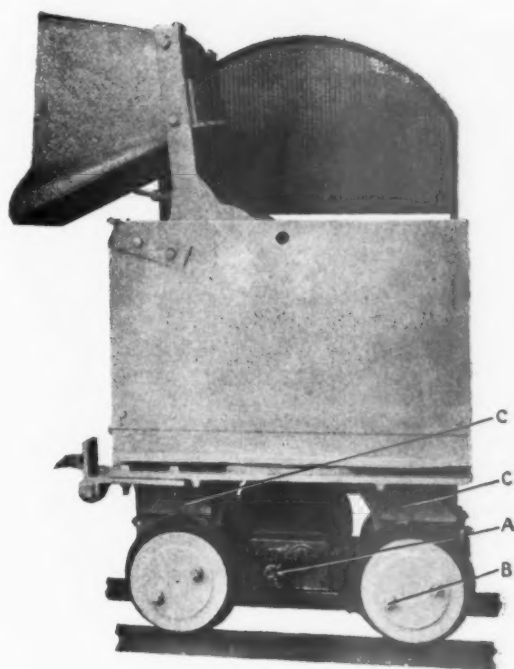
In this particular mine we always have two conveyors working in each room heading just as soon as two can be installed and serviced. While one conveyor is driving the pair of headings, the second unit is removing rooms from the barrier pillar inby. When the headings are completed, both units are placed at the top of the two headings and the rooms brought out together, making it possible to bring back the chain pillars and rooms at the same time. The speed at which these room headings are completed, eliminates the necessity of any tie or timber replacements, even when untreated wood is used. This system is shown on Sketch 4.

At this particular operation, the limiting feature is the size of the 300-ft. shaft and the capacity of the hoisting equipment necessitating the use of a very small mine car. Our single room system with its steady, every-day production is especially applicable due to this limiting feature. In other words we cannot tolerate a system which does not give us a

MUCKING

at North Lily Mining Company

By J. S. FINLAY *



Eimco-Finlay Loader

AT NORTH LILY mine the character of the ore bodies allowed practically all ore to be mined directly or through slides into ore chutes.

Loaded into 16-cu.-ft. cars, the ore is hauled by storage-battery locomotives to the shaft; at surface, cars dump into storage bins which feed an aerial tramway to the railroad one-half mile distant.

During the mine development and subsequent search for new ore bodies, about 30 miles of development work was driven from the North Lily shaft.

Until July, 1931, the mucking was done by hand. About this time the Finlay loader was introduced and in a short time was doing practically all drift mucking. It seemed rather an improvement over hand loading when one operator loaded the muck from four 6-ft. drift rounds in one eight-hour shift.

In one drift, where costs were unusually high due to heavy hoisting and pumping charges, the best we could do by hand was \$32 per foot. The first of these loaders built, and on its first trial underground, made possible an advance of 410 ft. in the first 30 days, at a cost of \$22 per foot. This, according to my figures, made a saving of \$4,100 in 30 days, which seems a reasonable earning for a \$2,000 machine.

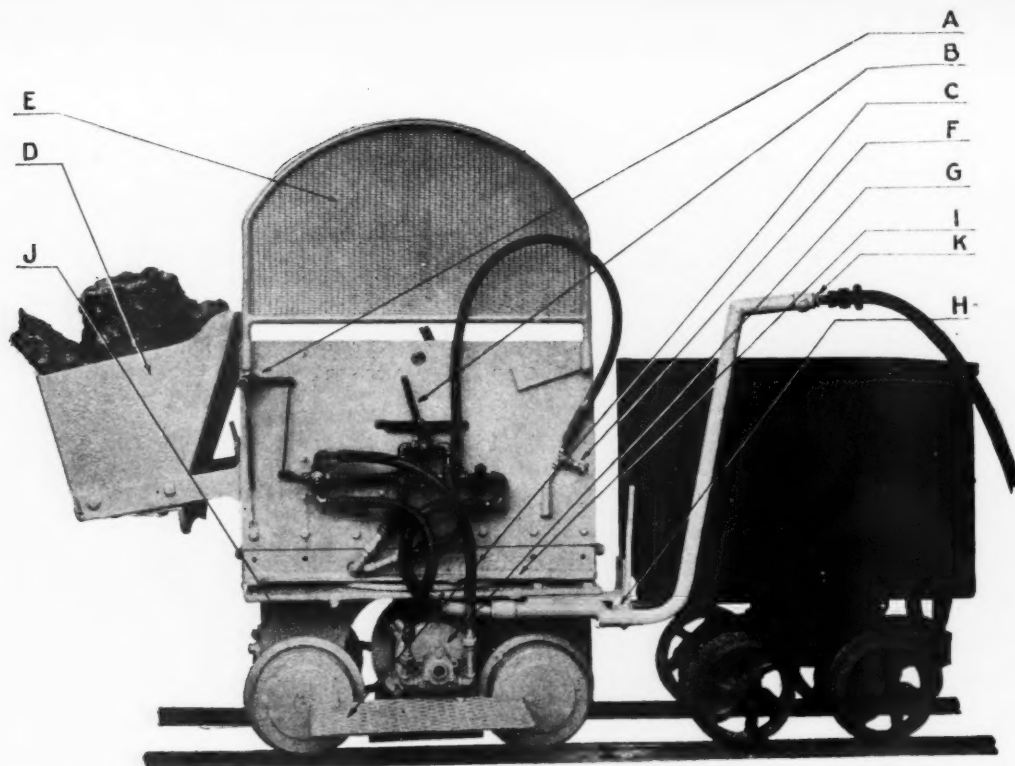
After an extended experience here and there in many mines, our drifting costs at North Lily astonished me. Drifts that I had contracted at \$8 per foot for labor in 1928-29 were costing \$1.75 per foot. Real easy ground cost \$1.50 per foot (total labor; loaded cars delivered to side track not over 600 ft. from heading).

The machine was designed for use in small drifts and cross-cuts and has more than fulfilled expectations in this work. I hoped for a machine that would easily clean up two or three drift rounds per eight-hour shift, but in several important mines where the machines are properly handled, four and five rounds per eight-hour shift is standard practice.

There is no longer any argument about mechanical loading in mine headings if costs and speed are of interest to operators.

In stoping, the machine makes an equally good record. In one very large copper mine the entire top-slicing methods are being revised to provide the most

* Superintendent.



Eimco-Finlay Loader With Mine Car in Loading Position

favorable conditions for loader use. In this operation the usual expensive preparations for stopping by driving raises and finger-raises is largely eliminated. Due to the increased speed with which a "slice" can be extracted, longer posts are used, giving an increased tonnage per slice. Altogether this method saves timber, cuts out a lot of raises and all finger-raises and cuts labor costs 60 percent.

A picture in a recent *Engineering and Mining Journal* shows a loader in an Australian mine loading from a huge pile of ore shot down from above the drift. Under the conditions illustrated, one man might be expected to load 150 tons into mine cars—costing 3½ cents per ton for labor for actually loading.

Loading from a drift is often faster than loading from an average mine chute.

Opening up an over-head stope by means of chute raises is another good set-up for a loader; loading from the drift being so easy, the raises are run up 20 to 40 ft. before any permanent timber or chutes are placed. This avoids timber breakage by blasting and allows much better ventilation while getting the raises started.

North Lily labor costs for driving 5-ft. by 8-ft. drifts and cross-cuts, using the loader, ran from \$1.50 per foot in favorable rock to a maximum of \$2 per foot in quartzite. This labor cost means breaking the rock, loading it into mine cars and tramping it to motor haulage side track (not over 600 ft.). This cost is based on using the loader in two headings only.

One ¾-in. hose supplies sufficient air at 75 lbs. pressure to operate the machine. As car switching slows down the loading operation to less than half time, the air consumption is low.

If these machines are not carelessly handled or deliberately abused, repair costs should not exceed ½-cent per ton. A general superintendent, using nine loaders, has stated "savings in shovels and turn-sheets more than offset maintenance and depreciation charges of our Eimco-Finlay loaders."

Under favorable conditions the loader will load at the rate of 2 tons per minute. A larger model designed for 36-in. gauge track (not yet built) should load up to 5 tons per minute.

Operators find many ways to use the loader to avoid hard manual labor—such as driving spiling in drifts, giving a heavy car a start, lifting machines and timbers, etc.

COMMERCIAL production, imports, and apparent consumption of raw asbestos in the United States in 1934 showed gains over 1933. The total quantity of asbestos commercially produced in the United States in 1934 was 5,087 short tons, valued at \$158,347, compared with 4,745 short tons, valued at \$130,677 in 1933. It was practically all chrysotile from Arizona and Vermont, by far the larger part originating in Vermont. Amphibole was mined in Maryland, Montana, and Washington.

Total imports of unmanufactured asbestos into the United States in 1934 amounted to 120,334 short tons, valued at \$3,377,994. In 1933 they were 119,494 tons, valued at \$3,540,675. Exports of unmanufactured asbestos in 1934 were 1,669 short tons, valued at \$94,182, compared with 1,378 tons, valued at \$88,521 in 1933. The apparent consumption of asbestos in the United States in 1934 (123,752 short tons, valued at \$3,442,159), was slightly greater than in 1933 (122,861 tons, valued at \$3,582,831).

As the United States produces a very small proportion of its consumption it is dependent upon foreign supplies to satisfy its requirements. In 1934 Canada contributed 93.9 percent in quantity and 89.6 percent in value of the total imports of asbestos into the United States. The total Canadian supply (113,060 short tons, valued at \$3,026,563), was classified and divided as follows: Crudes (highest grade), 1 percent; mill fiber, 37 percent; stucco and refuse, 62 percent. In 1933 total imports from Canada were 112,915 tons, valued at \$3,192,593. Average values per ton in 1934 were: Crude, \$200.04; mill fiber, \$43.08; stucco and refuse, \$14.29. All mill fiber imported in 1934 came from Canada, and constituted 35 percent of total imports into the United States. Imports of stucco and refuse from Canada in 1934 constituted 58 percent of the total for the United States.

Gold Mining in California

(Continued from page 14)

Notwithstanding the fact that so many countries have suspended the gold standard, the demand for gold continues at an unheard of rate, and as other mediums of investment have become less secure and attractive, the unimpaired reliability of gold has resulted in an ever increasing demand for gold as the most secure medium for Government and private investment, and the economic law of supply and demand is again operating to greatly increase the supply of gold, which constitutes one of the most favorable of the fundamental factors in expediting recovery from world depression and in establishing a sound foundation for a new era of prosperity.

Probably the greatest advance in gold development has been modern metallurgical miracles. When we see the progress from the steam stamp mills and the old concentrators to the modern ball mills and selective flotation and cyanidation, we then realize that we are in a new era of mineral development. Originally, the various gold mining plants in California were either run by water power or by steam. This was an expensive method and only the highest grade of ore could be used. We now see a never ending change in the willingness of the mining industry to throw out equipment costing thousands to make room for something better, and in the place of steam stamps, we have crushers, make for an increased recovery, and in gold mills, when an all fine method is used for flotation, cyanidation or concentration, the mill recovery has been raised from approximately 80 percent to 98 percent, thus, it has been possible to work lower grade ores at a profit.

A greater aid to the mineral industry of California has been the development of hydro-electric power. This has given to isolated communities situated in sparsely settled districts, power for the reduction of minerals and metals and for the operation of machinery at a price that makes possible the operation of low grade deposits, while under the old era of steam it would have been impossible to operate at a profit. The development of the internal combustion engine and the discovery of petroleum have further assisted in bringing cheap power to the mine operator, and this has hastened the development of prospects and has advanced mining activities in specially isolated communities.

What then can we expect in the future from gold mining in California. There are many things which the gold mining industry in California needs today in order that it may function properly and give the maximum amount of employment. First and foremost is a better cooperation between the workmen and the management, together with the opportunity and the desire on the part of both to make mining safer and reduce the hazards so that the risk to life and limb may be less, thus making possible and automatically decreasing the rates

of compensation insurance. Such a cooperation between workmen and the management is certain to bring about a better feeling and practically eliminate all labor troubles.

Equitable taxation. It should be realized that the mining industry being one which is faced with constant depletion of resources, should have the most careful consideration in the matter of taxation, both county and state, and Federal, and when it is realized that practically all gold mining is non-competitive and a large consumer of farm and industrial products, this factor should be favorably considered.

The California Mineral Board, recently appointed by Governor Merriam, is well aware of these facts, and in future discussions will attempt to broaden the powers of the State Mining Bureau so as to include geological examination and research, legal information, accounting and auditing and executive advice to small mines and prospectors, such as other countries have, so they can be informed as to their properties, as we fully realize that such mineral lands, both as to gold and other metal and mineral products, are the potential mines of tomorrow; that any encouragement given them will result in untold benefit to our state. We have faith in the future of our country, and the mineral industry is making its plans to meet the ever changing economic conditions, and the operators are convinced that modernization is the road to ultimate success, and never in the history of the world have men of vision had a better opportunity to put their dreams into a concrete form, thereby making themselves a part of modern industry and business enterprise.

Life offers fewer thrills than to see one's thoughts take form and from vague and indefinite beginnings by the dint of mental concentration and well directed research take definite shape in the forms of processes, machines and plants, and these take their place among things that lighten the burden of humanity and make life broader and more abundant.

A SUMMARY of figures compiled by the United States Bureau of Mines on production in various mineral industries for the calendar year 1934 has recently been released.

Aluminum—74,177,000 lbs. valued at \$14,094,000 compared with 85,126,000 lbs. valued at \$16,174,000 in 1933.

Zinc—383,281 short tons valued at \$32,962,000 compared with 337,269 tons valued at \$28,331,000 in 1933.

Copper—476,000,000 lbs. of smelter copper compared with 449,999,143 lbs. in 1933 (smallest since 1895); 462,600,000 pounds of new refined copper from domestic sources compared with 481,300,000 lbs. in 1933; new refined copper from domestic and foreign sources was 897,600,000 lbs. compared with 741,578,552 lbs. in 1933.

Manganese—26,000 long tons of ore (containing 35 percent or more metallic manganese from domestic mines exclusive of Puerto Rico) valued at \$600,000

compared with 18,558 tons valued at \$452,173 in 1933. Imports for the 11 months ending in November were 310,136 tons (containing 152,740 tons of metallic manganese) compared to 288,187 tons (containing 141,458 tons of metallic manganese) for all of 1933. (More than half of the 1934 imports were from Soviet Russia.)

Iron Ore—24,889,000 gross tons (estimated) mined in 1934 representing an increase of 42 percent over 1933. Shipments were 25,995,000 tons, valued at \$67,103,000, a 6 percent increase in quantity and 5 percent increase in value over 1933.

THE domestic unmanufactured sheet mica industry in the United States, which has steadily declined since 1929, reached a point in 1932 which was lower than for any year since 1919. The total quantity of domestic sheet mica marketed in the United States in 1932 was 338,997 pounds (169 short tons), valued at \$45,882. Compared with 1931, decreases of 65 percent in quantity and 59 percent in value were recorded. Figures covering this phase of the mica industry previous to 1920 are not comparable.

The total domestic marketed production of scrap mica (14,080,000 pounds, or 7,040 short tons, valued at \$83,777), showed a small increase, compared with 1931; the value, however, declined. Imports of waste and scrap mica in 1932 were 2,720,731 pounds, valued at \$11,908, compared with 4,129,216 pounds, valued at \$22,057 in 1931. In 1932 domestic commercial production of ground mica was 15,409,846 pounds, valued at \$310,840, compared with 15,613,052 pounds, valued at \$436,436 in 1931. Imports of ground mica in 1932 were 111,771 pounds, valued at \$383, compared with 1,200 pounds, valued at \$36 in 1931.

Commercial Production of Metallic Beryllium

(Continued from page 26)

Recent investigations of physical properties of Beryllium-Cu. alloys are reviewed. These alloys are of precipitation or age hardening type; the best effect is obtained with 1½ to 1¾% Beryllium. In a 50% reduction, 1.36% Beryllium showed a tensile strength of 120,000 lbs. per square inch, with a 3% elongation and a hardness of 185. In a 75% reduction with 1.36% Beryllium, a tensile strength of 144,000 was attained with 1.75% elongation and a hardness of 208. With a 90% reduction same percent as above a tensile strength of 167,000 was obtained with a 1% elongation and a hardness of 210. Recent investigations with 2½% Beryllium have shown that an ultimate tensile strength approximating 200,000 lbs. has been reached. Annealed copper wire with various percentages of Beryllium have shown an increased electrical conductivity from 20% to 100%.

MECHANICAL LOADING

In Some Metal Mines

Interstate Zinc & Lead Co.'s Hartley Mine,

Tri-State Zinc and Lead District

Britannia Mining and Smelting Co., Ltd.,

Britannia Beach, British Columbia

Mining Disseminated Lead Ore

Southeast Missouri District

American Zinc Co.

Tennessee

Magnetite Mining

New York

Hematite Mining

Marquette Range

This material presented in cooperation
with
CHARLES WILL WRIGHT,
Chief, Mining Division
United States Bureau of Mines

Hartley Mine

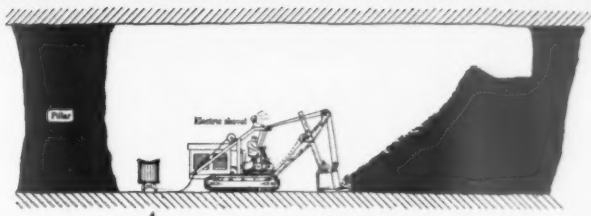
By CARL N. ANDERSON

ALL underground loading is done into round sheet-steel cans which are 32 in. in diameter, 32 in. deep, and hold an average of 1,400 lbs. each. Each can is transported to and from the shaft station on a low flat car.

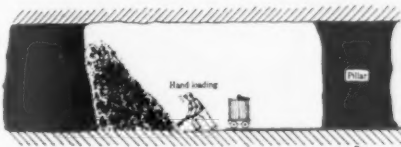
In the low ground all of the loading is done by hand, the shovelers working on a contract basis and using No. 2 scoop shovels. The average loading ability of the Tri-State shoveler is 35 tons per eight-hour shift. Each shoveler works on an individual track, which is laid as close to the pile of broken ore as possible. He receives his empty cans at a conveniently located siding and places the loaded ones on the main haulage track. Each shoveler supplies himself with a number of wooden paddles, marked with a numeral assigned to him by the mine foreman. In each can, loaded by him, he places one of these markers, and as the loaded cans arrive at the shaft station, the markers are placed in pigeon holes of corresponding numbers. At the end of the shift, the markers are counted by the mine foreman and each shoveler given credit for his work. A count is also made at the surface of all cans hoisted, and this acts as a check on the count at the underground shaft station. This method is very simple, and it is surprising how few errors occur.

In the high ground, both hand and power shovel loading is employed. Hand-loading conditions are the same as in the low ground, except that two men shovel into a can where the pile of broken material is large.

The Tri-State district has for a long time been the scene of experimentation with power shovels and mechanical loading devices. Very few of the various machines tried out have proved to be economical, with the result that mechanical loading is employed in only a few mines at this time. The power shovels used at the Hartley mine were developed at this property and have been found to fit into the operating program with a substantial saving in the cost of loading. When the question of power loading came up, the desire was to obtain a shovel that was mobile, electrically operated, fast, and of comparatively low



cost. The machine that was adopted was developed from a light surface shovel of the boom and dipper stick type that was already on the market (Fig. 6a). For surface use this shovel was powered by a gasoline engine. As this engine could not be used in the mine, it was replaced by a 15-hp. electric motor which was connected to the drive shaft



with a silent-chain drive. Other changes in the surface-type machine were made, such as cutting down the length of boom and dipper stick and reducing the ground clearance. A new type of dipper was designed for loading into the round cans, and electrical devices were added so that the operator would have perfect control

of the mechanism. This shovel as developed for underground use is operated by one man, is rapid both as to mobility and action, and can be operated in a nine-foot room. It has ample

power to clear away boulders weighing several tons and so far has proved economical both as to upkeep and operation.

The costs per ton of loading with a power shovel of this type compared with the costs of hand shoveling follow:

Power shovel:

Period: 127 workings days.

Material loaded: 24,516 cans
(16,565 tons).

	Cents
Connected energy charge...	0.382
Power consumed .....	.946
Depreciation and repairs	3.070
Interest charge .....	.776
Labor (one operator with helper and extra trammer)	7.830

Total cost per ton.... 13.004

Hand shovelers:

	Cents
Contract price	21.202
Shovels and picks .....	.167

Total cost per ton.... 21.369

encountered. A replaceable manganese-steel lip is an important feature of its construction. This scraper handles 1,600 to 1,800 pounds of muck at each pass and when set up as usual, about 25 to 30 feet from the face, has an actual loading rate of about two tons per minute. Cars are switched on an O'Rourke car switcher; the gross loading rate, including switching, is 60 to 70 tons per hour.

Ample electric lighting is provided on the scraper slide so that the operator works under the best possible conditions.

The tail sheave is hung on a chain stretched across the face, attached to Lewis wedges driven into holes drilled for the purpose. It can thus be quickly moved from side to side.

Figure 10 is a drawing of the scraper slide; more detailed information may be found under 4,100-Foot Level Haulage Extension.

This machine proved to be a very fast mucker, much lower in first cost than any shovel-type machine of equal capacity, simple to operate, and extremely reliable. An occasional broken cable is about all the mechanical trouble to be expected.

Considerable experimental work was done on the 600 and 850 levels in slushing ore from drawing points under the stopes to transfer raises.

A 35-hp. hoist was again used, this time handling a 60-inch hoe-type scraper of about two tons capacity. Ore was fed on to the sill through a chute, the height of the muck pile being so regulated that the scraper could easily pass it on its return trip.

A bed for scraping was made by laying worn-out 45-pound rails side by side the full width of the drift. This, by eliminating the wear on the scraper and the frequent spilling of part or all of the load characteristic of hauling over rough bottom, has proved of great importance.

Ample illumination is provided by electric lights, as good visibility is very necessary for efficient control of the scraper.

Rate of loading, of course, varies with the type of muck handled, the presence of large boulders, and hence the rate of flow through the chute, the chief determining factor. The actual rate of loading muck after it is drawn from the chute is 1½ to 2 tons per minute.

The latest installation is a 75-hp. double-drum electric slusher hoist, capable of handling a 5-ton scraper; this was used with great success for removing overburden from above the East Bluff orebody prior to gloryholing. It will now be used for transferring ore underground.

Britannia Beach

By C. V. BRENNAN

MECHANICAL loading at Britannia has been applied to two classes of work:

1. Mucking development rounds:
 - (a) Main haulage-tunnel extension, employing the larger types of mucking machine.
 - (b) A few headings of intermediate size.
 - (c) Shaft-sinking—a semimechanical application.
2. Transferring stope muck:

Handling broken muck from stope drawing points to transfer raises.

The first major work with mechanical loading equipment was done in the 2,200-level haulage tunnel driven in 1923-24; this connects the Fairview and Victoria workings. In this tunnel, which is 9 by 8 ft. in the clear, an early type of nonportable scraper slide built of an angle-iron framework bolted to column bars was tried out. This was followed by two types of Armstrong Butler Shovelers, a Conway electric shovel, and finally by a locally built portable scraper slide described later.

In sinking the Victoria No. 2 shaft, semimechanical loading was practiced on a system which has been successfully used at the United Verde and elsewhere.

Muck was scraped with shovels into a flat pan which was lifted by a small tugger hoist and dumped into a mine car carried on an extension platform below the cage. This system eliminates the hardest work of shoveling, that is, the direct lifting of the load on the shovel. In the work here, particularly at Victoria, having the muck in a car greatly facilitates its disposal as waste filling.

In 1931 two 35-hp. double-drum (type HDE 35) electric hoists were purchased to transfer broken ore short distances by slushing. Such good results were ultimately obtained from this equipment that one of them was mounted on a locally designed and built portable scraper slide for advancing the 4,100-level haulage tunnel. This proved a great success. These installations are now regarded as standard practice.

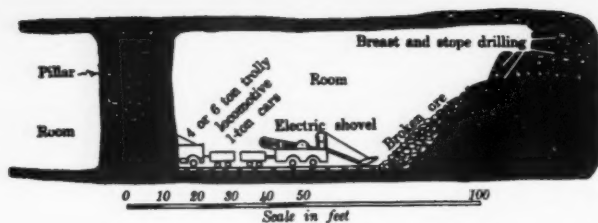
This tunnel is 10 by 12 feet and was advanced 1,497 feet during 1932. A portable scraper slide was used for all mucking; it was mounted on four wheels and equipped with a coupling at the rear so that it could be pushed to the muck pile by the train of empty cars and was designed to load into 120-cubic foot cars. A 35-hp. hoist handling a 48-inch scraper was used.

After two or three experiments a standard hoe-type scraper was found best suited to the rather chunky muck

Disseminated Lead Ore

By C. F. JACKSON

IN DEVELOPMENT work and in stopes where enough ore can not be broken to keep a mechanical loader busy, the ore is shoveled into cars by hand. The usual task or "score" for a hand loader is 20 tons. This score is reduced, however, where loading is difficult, as



Section Showing Operations in Thick Ore

when there is a long tram. The mucker does his own tramming from the siding or "loop," as it is locally called, to and from the loading point, ordinarily using a mule.

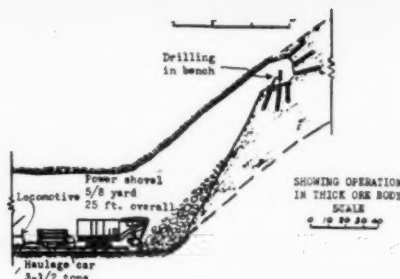
At present there are seven mechanical loaders in the mine, which is the subject of this report. These are of the shovel or "dipper" type, mounted on caterpillar traction, and have a full 360-degree swing; the dipper discharges its load directly into mine cars. These shovels are of two different types. One is equipped with a single 25-hp. A.C. motor, all three motions being operated through clutches to the same drive. The other

shovel operator is paid for loading under a bonus system whereby a "score" or task is set for which he receives a regular daily wage, and additional payment is made for tonnage in excess of this. The usual score is 42 cars of 2½ tons capacity each, but this is varied to suit special conditions. Occasionally in extreme cases it is as low as 32 cars, or as high as 48 cars.

Two muckers are usually employed in each development heading and are given 8, 10, or 12 hours' pay for mucking out the round. This amounts to a bonus for leaving a clean set-up for the drillers working on the opposite shift.

has separate drives for each motion.

The shovels are operated by one man, who usually also transfer his own cars from the locomotive gathering loop to the shovel, using a mule. The



into consideration, such as the effect on cost of stoping, the amount of money tied up in development work, and the crude content and faulted condition of the deposit.

The scraper hoist of the clutch type with planetary transmission, operated by 25-hp. direct-current motor, has proved the most satisfactory hoist to date. Direct current as applied in haulage locomotive motors is found to be more efficient for this kind of load than the alternating current. If the voltage on the scraper hoist motor is made the same as the voltage on the haulage locomotive motor, no extra line will be required. The scraper motor can be operated by simply connecting it to the rail and trolley wire; as most scrapers are served by a haulage locomotive, this is very important. Scrapers of the hoe type are employed exclusively.

Air-driven shovels of the dipper type have proved more satisfactory in this work than the electrically driven machines. They have a lower first cost, smaller upkeep, will handle an equal amount of material per shift, and are easy to transfer from one working place to another. The air consumption with the air-driven shovel is high, giving a higher power cost per ton loaded. When it is considered, however, that the shovel is operated in unventilated places and often directly after blasting in a drift, the benefit of the exhaust air for ventilation may offset the lower power consumption of the electrically operated type.

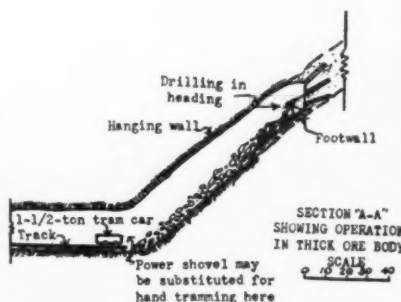
As compared to scrapers, the shovels have a higher first cost and higher power consumption. They have the ad-

Zinc

By HARLEY A. COY *

ALL shoveled ore from stopes is loaded on a ton-contract basis. Loading in development drifts is on a contract price per foot of advance, the contract varying with the cross section of the drift. Stope loaders are required to load 13 cars before leaving the mine. Three contract-shoveling rates are in use, their application depending upon shoveling conditions in individual stopes.

Slushing hoists in use are electrically driven, power being obtained from the 240-volt trolley circuit. Units of 25 hp. are used in stopes under average slushing conditions. Hoists of 10 to 15 hp. are desirable in clean-up work. A hoist of the two-speed (mechanically controlled) change type on the load line is being tried out. It has been found to be particularly desirable in rough material. Slushing hoes in general use are constructed from manganese plates.



The haulage cars are drawn by electric locomotives of the trolley type.

The hand tram car, which is very low (2 ft. 7 in. above rails), is used when the loading is done by hand. The haulage cars are high (4 ft. 5 in. above the rails), and are loaded by power shovels or with scrapers.

The mechanical loading is a problem on which much time and money have been spent. The problem has by no means been completely solved, but the present conclusion is that a combination of the scraper and small air-operated shovels is best suited to these deposits.

In arriving at this conclusion, factors other than the actual loading of the material have been taken

Magnetite

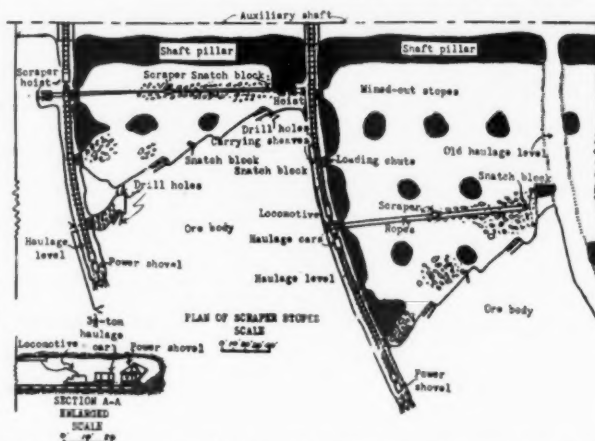
By A. M. CUMMINGS*

METHODS and costs of mining magnetite in the Mineville district of New York were generally outlined in an Information Circular of the Bureau of Mines.

Loading and tramming in this district is a problem that has received much study and attention.

Tramming in the auxiliary shafts is by hand-pushed tram cars with a capacity of 1½ tons of ore, and by haulage cars with a capacity of 3½ tons of ore.

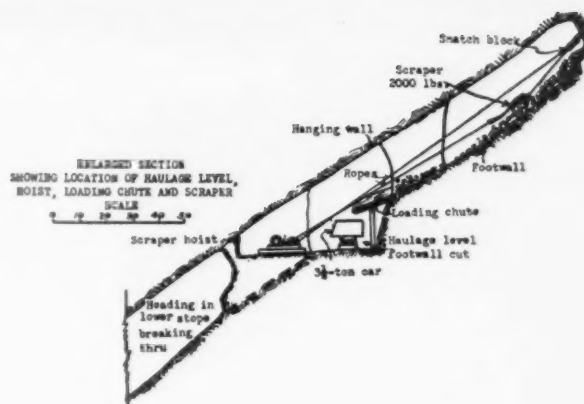
*Consulting Engineer.



Plan and Section Showing Method of Stoping and Loading With Scrapers, Mineville District

vantages, however, of working better in a drift and of being suitable to replace hand loading in most places on the levels without changing the mining method. The total loading cost is about the same with the shovels as with the scrapers, and in either case is dependent on the quantity of broken material available. There is no increase in the stoping cost.

The electrically driven shovel shown in Figure 7 will operate in a space 15 ft. wide, and has proved to be the most satisfactory loading device where the ore body over a considerable area is large enough to give it operating room.



Hematite

By LUCIEN EATON *

METHODS of loading ore in stopes in this district may be briefly described as follows:

LOADING ORE IN STOPES

By hand.—In stopes where there is much rock to sort out, and in stopes the life of which will be short, it is better to load the ore by hand than mechanically.

The standard car is made entirely of steel, is of the end-dump type with the body rigidly fastened to the truck, and is equipped with 14-in. roller-bearing wheels. The car stands 37½ in. high, weighs 1,400 lbs. empty and 7,000 lbs. loaded, and carries a load of 5,600 lbs. or 2½ tons; it has a capacity of 37 cu. ft. The track is 24-in. gauge and is laid with 20-lb. rails.

a certain price for filling the car and 1 cent for every 45 ft. trammed. When a locomotive is provided, only the filling price is paid. The contract basis is as follows:

PRICE PER CAR (2½ TONS)

	Large piles	Stopes	Drifts	Chutes
Hand-filling	\$0.47	\$0.52	\$0.57	....
Chute filling	....	....	....	\$0.20
Tramming (per 45 ft.)	.01	.01	.01	.01
Minimum from chute	....	....	....	.28
Minimum by hand	.55	.60	.65	....

NOTE: Prices are about 10 percent higher for wet places. Prices for filling vary with the type of chute.

Loading by Scrapers into Chutes.

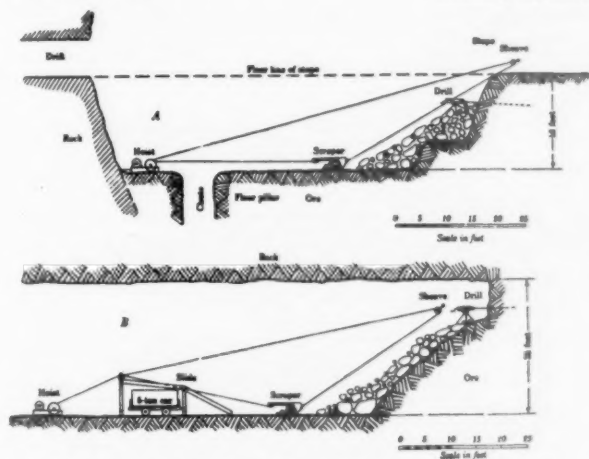
On sublevels and where a chute is within reach the broken ore is moved from the breast to the chute by scrapers (fig. 6A). These scrapers are all of one design, 48 in. wide and 7 ft. long, of the hoe type, and weigh 1,500 lbs. The blade, side-plates, and draw-head are made of manganese steel. The blade is the only part that wears appreciably, and this has a life of 6,000 to 10,000 tons, averaging about 8,000 tons.

The scraper is hauled by a 25-hp. double-drum electric hoist, with planetary transmission, using ¾-in. extra plow-steel wire rope with independent wire-rope center (fig. 9). The motor is 25-hp., 900-r.p.m., 440-v.a.c., 3-phase, 60-cycle, of squirrel-cage type. A complete scraping outfit, exclusive of electric cable, costs \$1,150 set up in place.

One miner and one scraperman constitute the crew in a stope.

The scraperman helps the miner in setting up and tearing down his machine, and the miner helps the scraperman rig up his scraper-blocks. The miner is paid by the car trammed from the chute and in most places the scraperman is paid by the day. This system is gradually being changed to a contract basis for both men. Contract prices per car (2½ tons) dumped in the chute vary from 90 cents to \$1.50, including both breaking and scraping.

Loading Cars with Scrapers.—In a few places semiportable steel scraper-slides are used to fill main haulage cars (fig. 6B). The scraper slides are not mounted on wheels, and must be taken apart to be moved. The hoist is not mounted on the slide, but is set up at one side of the track, and the ropes pass through blocks hung from the back or from the framework of the slide. Both hoist and scraper are of the same type as used in the stopes, previously described, and the crew in the stope is also the same—one miner and one scraperman. Main-line cars stand 56 in. high and hold 76 cu. ft. (5½ tons). Exclusive of switching, the time required to load a car is 6 minutes. Including delays and switching, four cars (22 tons) are loaded in an hour. The number of places using this equipment is being increased. The slide weighs 3,660 lbs. and costs \$360.



A. Method of Removing Floor Pillars. B. Method of Breast Stopping Using Scrapers.

In most places the tram is short, and the car is dumped into a chute by means of a cradle. Where the tram is long the trammers are supplied with a 1½-ton storage-battery locomotive.

The trammers (loaders or shovelers) work in pairs on contract; they are paid

*Consulting Engineer.

LINK BELT COMPANY announces the following promotions in its central-division conveyor sales organization: **William L. Hartley**, heretofore manager of Detroit office, assumes position of manager of foundry equipment sales, with headquarters in Chicago. **Harold L. Hoefman**, heretofore manager of the company's Indianapolis branch, succeeds Mr. Hartley as manager of Detroit office. **Richard B. Holmes**, of the St. Louis office, succeeds Mr. Hoefman as manager of Indianapolis branch sales. **Carl A. Blomquist**, of Chicago, succeeds Mr. Holmes at St. Louis, where he will assist **Howard L. Purdon**, manager.

PERSONALS

James H. Pierce, of James H. Pierce & Company, consulting engineers, has been elected chairman of the board of the Scranton Coal Company.

W. R. Wade has been elected president of the Park City Consolidated Mines Company.

Governor Cooney, of Montana, has appointed **William B. Daly**, **Carl J. Trauerman**, **Samuel Barker, Jr.**, **Albert E. Wiggin**, and **Frederick Laist** members of a state commission to help secure adequate tariff protection for copper.

S. Power Warren has opened offices on the Pacific Coast, at Auburn, Calif., for consulting practice. He formerly was associated with the Colorado School of Mines as professor of metallurgy.

Arthur D. Davis has resigned his affiliation with the American Smelting and Refining Company, to become mine superintendent of the properties of the San Luis Mining Company, with headquarters at Tayoltita, Durango.

Alan Probert has become associated with the metallurgical engineering firm of Galigher Company, of Salt Lake City. He formerly was with the United States Smelting, Refining and Mining Co.

B. E. Schonthal & Co., Inc., announce the removal of their offices to the Steger Building, 28 East Jackson Boulevard, Chicago, Ill.

John W. McCoy, general manager of the explosives department of the du Pont Company, has been elected a member of the company's board of directors, and has also been made a vice president and member of the executive committee. **Edward B. Yancey** succeeds him as general manager of the explosives department.

Mr. Carlos M. Heath has been appointed assistant metallurgist on the staff of Battelle Memorial Institute of industrial and scientific research, Columbus, Ohio. Mr. Heath is a graduate of Michigan State College, from which institution he also received his master's degree. Prior to joining the Battelle staff, Mr. Heath held a position in the metallurgical department of the American Brass Company at Waterbury, Conn. At the Battelle laboratories Mr. Heath has been assigned work in connection with a new metallurgical project in the nonferrous field.

Myron R. Nestor, a University of Minnesota graduate, and **Philip C. Rosenthal**, a graduate of the University of Wisconsin, have been appointed members of the technical staff of Battelle Memorial Institute, Columbus, Ohio.

At the annual meeting of stockholders of the General Cable Corporation, **G. D. Guggenheim** was elected a director to succeed **H. A. Guess**.

Frank E. Blanchard, formerly manager of sales, southeastern states, for the Climax Engineering Co., of Clinton, Iowa, has joined Caterpillar Tractor Co. at Peoria, Ill., as a member of the special sales department.

The appointment of **Dr. Bruce A. Rogers** as a member of the technical staff of Battelle Memorial Institute, Columbus, Ohio, has been announced by **Clyde E. Williams**, director of the laboratories.

The following elections were made at the annual meeting of the Coal Control Association of Western Pennsylvania: President—**J. D. A. Morrow**, president, Pittsburgh Coal Company; Vice President—**Ralph E. Jamison**, Jamison Coal & Coke Company; Secretary and Treasurer—**Byron H. Canon**.

George H. Bucher has been elected a vice president of the Westinghouse Electric and Manufacturing Company, with headquarters in New York. Mr. Bucher, who is also president and general manager of the Westinghouse Electric International Company, has been connected with the Westinghouse organization since 1909.

Dr. Otto Sussman, chairman of the board of the American Metal Company, Ltd., was elected president of the Mining and Metallurgical Society of America at a dinner of the Society on January 29 at the Columbia University Club. Dr. Sussman exhibited moving pictures taken on a trip through the Rhodesian copper fields. **E. V. Daveler** of the Utah Copper Company was elected vice president and **P. E. Barbour**, secretary.

W. A. Janssen, Deputy Administrator of the NRA, addressed the meeting on "Codes and Their Relationship to the Mining Industry."

J. Noble Snider, vice president, Consolidation Coal Company, is recuperating from an appendectomy.

W. P. Chinn, general manager of Pickands, Mather & Company, Duluth, Minn., is now in Florida.

C. D. Craddock, formerly of the Utah Fuel Company, has been elected president of the National Coal Company, succeeding **F. A. Sweet**, who has resigned because of ill health.

C. A. Kumke, formerly mine superintendent for Ray Consolidated, is now superintendent of Golden Queen Mining Company, Mojave, Calif., which recently purchased the Silver Queen bonanza on Soledad Mountain, Kern County, Calif.

Ira B. Joralemon, of San Francisco, has been named special master for further consideration of fourteen counter claims of the Consolidated Coppermines in its litigation with the Nevada Consolidated Copper Corporation.

C. F. Wood, manager of the American Steel & Wire Company's plant at Worcester, Mass., has been appointed vice president in charge of operations with headquarters at Cleveland, succeeding **J. L. Perry**, who has gone south to direct the operations of the Tennessee Coal, Iron and Railroad Company as president.

C. I. Collins, superintendent of the Cuyahoga works will become manager at Worcester and **B. H. Gedge**, assistant superintendent of the Cuyahoga works, will succeed Mr. Collins.

Among the visitors at The American Mining Congress headquarters in Washington during March were—**D. R. Swem**, Northwestern Improvement Company; **Paul Weir**, Bell and Zoller Coal and Mining Company; **W. J. Jenkins**, Consolidated Coal Company of St. Louis; **R. J. Ireland, Jr.**, Owl Creek Coal Company; **Carl Scholz**, Charleston, W. Va.; **F. E. Wormser**, Lead Industries; **R. C. Allen**, Oglebay, Norton & Company; **D. A. Callahan**, Callahan Lead Zinc Company; **Stanley Williamson**, Union Carbide and Carbon Corporation; **Ralph M. Roosevelt**, American Zinc Institute; **Harold S. Jennings**, Utah Manufacturers Association; **Gus P. Backman**, Salt Lake City Chamber of Commerce; **L. W. Shugg**, General Electric Co.; **S. W. Blakslee**, Philadelphia, and Reading Coal and Iron Company; and **Albert Gately**, Republic Iron Company.

George M. Jones, president of the George M. Jones Company, prominent Ohio coal operator, died March 14 at Toledo, Ohio.

K. U. Meguire, president of the Dawson Daylight Coal Company, died at his home at Louisville, Ky., March 10. Mr. Meguire was widely known for his active interest in an efficient and prosperous coal industry. He was a leader; not only in the Kentucky field where his company's operations wield a wide influence, but throughout the entire coal industry, which loses a leader and friend.

Frank L. Morse, president of the Morse Chain Company, Ithaca, N. Y., widely known industrialist, philanthropist, and leading business man, died at his Florida estate on the 25th of March. He had long been identified with the mining field and was at one time director of the American Mining Congress.

MINING EVENTS

Coal

THE coal industry has the Washington habit, with many of the operators spending days and weeks, if not months in the nation's capital city, worrying with the legislative, and with the labor situation. During the past month leading operators from every coal producing district attended hearings on the Guffey-Snyder Coal Control bill; the Wagner Labor Disputes bill; and the conferences with the United Mine Workers in the negotiations for a new wage agreement. Many operators are still spending much time in Washington, but the exodus has been marked during the latter part of March.

The Joint Scale Committee of operators and miners, negotiating the wage scale for the Appalachian District has been in steady session. The members of the Scale Committee, for the operators is composed of J. D. A. Morrow, Pittsburgh Coal Company; Charles O'Neill, Madeira Hill & Company; W. L. Robinson, Y. & O. Coal Company; S. D. Brady, Jr., representing Northern West Virginia; J. D. Francis, Island Creek Coal, and Ralph E. Taggart, Stonega C & C Co., representing the high volatile Southern fields; M. L. Garvey, The New River Company, and L. T. Putnam, Raleigh Wyoming Coal Company, representing the Southern low volatile districts.

The United Mine Workers Members on the committee are: John T. Jones, Frank O'Donnell, Frank Miley, C. F. Davis, Van A. Bittner, Wm. Blizzard, G. W. White, W. Turnbuller, Bud Carr, Geo. Brenom, John Saxton, W. Minton, L. V. Hobson, Sam Caddy, James J. McAndrews, John Stines, James Mark, John Ghizzoni, Frank Hughes, George Smith, W. Hyner, Art Hall, P. T. Fagan, W. Hargest, Percy Tetlow, G. W. Savage, John L. Lewis, Phillip Murray and Thomas Kennedy. D. C. Kennedy, executive secretary, Kanawha Coal Operators Association, is chairman of the subcommittee, and A. J. Musser, Clearfield Bituminous Coal Corporation, is secretary.

At this writing (March 28) no definite action has been taken and no major questions settled. The subcommittee is giving careful consideration to the demands of the miners, which include recommendations for the six-hour work day.

A matter that is receiving the very careful attention of the subcommittee is the proposed amendment offered by the United Mine Workers to the effect that there shall be a provision in the agreement stipulating that all signatories to said agreement covenant and agree to respect and adhere to the provisions of the Code of Fair Competition for the Bituminous Coal Industry, and/or such legislation as might be adopted by the 74th Congress.

THE Subcommittee of the Senate Interstate Commerce Committee has presented to the full committee a revised Guffey Bill with the recommendation that the bill pass in the form as revised.

Among the salient changes in the measure as revised by the subcommittee are the following:

1. It does not declare the industry a public utility.
2. It changes in the method of allocation.
3. It provides for a revamping of the districts; and
4. Provides that maximum hours, established by two-thirds of the tonnage

TO THE RESCUE



—The Washington Post

and a majority of the employees, shall be binding on the entire industry.

Pending full Interstate Commerce Committee consideration of the bill, there is little possibility of early action on this measure. There is reason to believe that it will be some time before the Senate Committee will be able to get around to reporting the measure to the floor. The present legislative tie-up may cause many measures to be discarded which otherwise had good possibilities. This factor is expected to involve the Guffey Bill.

ACCORDING to press dispatches the "rank and file committee" of the United Mine Workers of America announced March 26, that they would issue circulars to 50,000 miners in the field to join the walkout April 1 to enforce their demand for a \$6 minimum wage for a

six-hour day and a five-day week. The elimination of all open shop agreements will also be included in the demand.

THE National Recovery Administration, March 14, approved the following amendment to the Code of Fair Competition for the Bituminous Coal Industry. This is Amendment VII: "Delete the period of the second sentence of Sub-Section (a) of Section 2, Article VII, and substitute therefor a semi-colon, and add after such semi-colon the following: provided each Code Authority, Divisional or Subdivisional, shall have one member thereon who shall be selected from nominations submitted by the accredited and recognized organization of employees." This amendment was submitted by the National Bituminous Coal Industrial Board and notice of opportunity to be heard was published February 2, 1935, and referred to in Bulletin No. 1318.

BITUMINOUS coal production in the United States for the week ended March 23 as approximately 9,350,000 net tons. Production for the corresponding week: 1934, 8,657,000 tons; 1933, 5,239,000 tons.

The report of the Bureau of Mines shows production of 8,802,000 tons for the week ended March 9, and 8,903,000 for the week ended March 16, 1935.

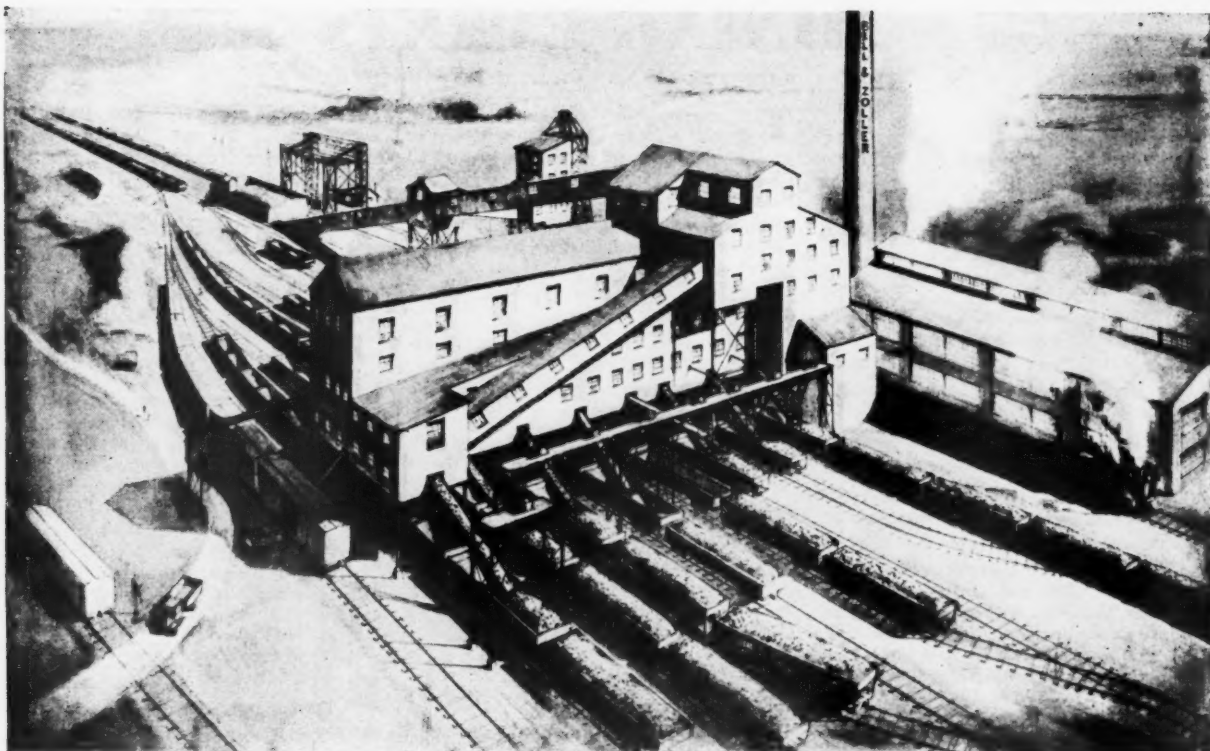
Production calendar year to March 23: 1935—100,682,000 tons (*); 1934—94,315,000 tons.

THE total production of anthracite (which includes colliery fuel) for the week ending March 9, as estimated by the United States Bureau of Mines, Department of the Interior, Washington, D. C., amounted to 734,000 net tons. This is a decrease, as compared with production of the preceding week, of 236,000 net tons, or 24.3 percent. Production during the corresponding week in 1934 amounted to 1,692,000 tons.

INDEPENDENT Anthracite producers, who marketed 11,300,000 tons of hard coal in 1934, held an organization meeting in Wilkes-Barre, Jan. 15, and launched a temporary set-up of their new selling agency—Independent Coals, Inc. The new organization is designed to effect an orderly distribution of anthracite and eliminate price cutting.

When producers representing 12,500,000 tons output are enrolled, the organization will become permanent.

Donald Markle, of the Jeddo-Highland Coal Company, was elected president; George F. Lee, of the George F. Lee Coal Company, treasurer; and A. B. Jessup, of the Jeddo-Highland Coal Company, secretary.



Bell and Zoller Coal and Mining Company's New Zeigler Preparation Plant. Capacity 1,000 Tons Per Hour of Mine-Run Coal. Construction Started January 1, 1935. Will Be Ready for Operation August 1, 1935.

SHIPMENTS of anthracite for the month of February, 1935, as reported to the Anthracite Institute, amounted to 3,945,542 net tons. This is a decrease, as compared with shipments during the preceding month of January, of 1,125,116 net tons, or 22.19 percent, and when compared with February, 1934, shows a decrease of 1,252,389 net tons, or 24.09 percent.

Shipments by originating carriers for the month of February, 1935, as compared with the preceding month of January, and with February, 1934, are as follows:

	February 1935	January 1935	February 1934
	Net tons	Net tons	Net tons
Reading Company	811,899	1,101,605	1,293,214
Lehigh Valley R. R.	770,125	867,338	835,419
Central R. R. of New Jersey	287,119	407,019	409,946
Dela., Lackawanna & Western R. R.	468,157	615,785	549,847
Delaware & Hudson R. R. Corp.	394,783	507,018	521,212
Pennsylvania R. R.	509,660	614,624	636,800
Erie R. R.	305,911	374,138	450,340
N. Y., Ontario & Western Railway	255,143	341,660	242,572
Lehigh & New England R. R.	142,745	241,471	258,581
	3,945,542	5,070,658	5,197,931

A BULLETIN issued by the U. S. Bureau of Mines tells of the remarkable record of Weston Dodson & Company in eliminating accidents at its

Oak Hill anthracite mine at Oak Hill, Pa. The bulletin says:

"The average production per fatality in this region for 1933 was 206,828 tons, an exceptional record showing the results of an intensive drive made by the Pennsylvania Department of Mines and the Anthracite Operators and workers to curtail the high accident rates heretofore prevalent in the region.

"As a direct result of its safety policy, the colliery has produced 1,044,000 tons of anthracite without a fatality; within three years it has reduced its total accidents from 645 to 105 per year, its com-

ganization that will go far in the continuance of this great work of mining anthracite."

AN interesting compilation of provisions of the 531 codes approved by the NRA has been made by the National Coal Association, from which we quote in part:

"The Code of Fair Competition adopted by the bituminous industry in October, 1933, provided for a 40-hour work week—five days of eight hours each. Effective April 1, 1934, the code was amended. The amended code specifies a uniform 35-hour week throughout the year—five days of seven hours each. The mine workers are now demanding that the code be further amended and be made to prescribe a uniform 30-hour week—five days of six hours each. How do these provisions compare with the corresponding provisions of other codes?

"Between July 9, 1933, and Nov. 2, 1934, 531 codes of fair competition applying to as many industries were formulated and approved by the President. An analysis of the provisions of these codes relating to hours per day and hours per week establishes five facts.

"(1) No other of the 531 codes prescribes hours per week as low as the uniform 35 hours per week prescribed in the bituminous coal code. Every other code specifying 35 hours per week or less as a minimum allows 40 hours or more

pensable accidents from 204 to 45 per year, and its lost time accidents from 335 to 67 per year. In addition, it has set up a smoothly functioning safety or-

in weeks of maximum production. In fact, the bituminous coal code is the only one of the 531 codes that does not permit a maximum of 40 hours per week or more.

"(2) Of the 531 codes there are only 13 besides the bituminous code that specify a minimum of seven hours per day or less. Ten of these have flexible provisions permitting maximum hours of 8 or 9. Only three of the 13 specify a uniform seven hours per day. Each of these has a flexible weekly provision under which 40 hours a week is permissible in busy seasons.

"(3) The seven-hour day and the 35-hour week prescribed in the amended bituminous coal code allow shorter permissible working time than is found in any other of the 531 codes, if the flexible provisions of codes containing such provisions are taken into consideration.

"(4) The tendency has been toward the establishment of longer working days and working weeks. Thus, every amendment adopted after the original approval of any code increased hours per day except the bituminous code amendment. Moreover, of the codes permitting minimum hours of less than eight per day, three-fourths were adopted before Jan. 1, 1934, while only one-fourth of them were adopted since that date.

"(5) The present bituminous coal code specifies a uniform work day of seven hours and a uniform work week of 35 hours throughout the year. In contrast with this 198 of the 531 codes have flexible provisions relating to hours per day, and no fewer than 457 out of the 531 have flexible provisions relating to hours per week.

"The specific provisions of the codes on which the foregoing statements are based may now be examined.

"(1) In analyzing the hour-per-week provisions of the codes it is necessary to bear in mind that a great majority of them have flexible weekly hours, enabling the industry to vary its hours of employment according to its rate of operation. In fact, only 73 of the 530 codes, outside the bituminous code, have a flat uniform hourly rate per week throughout the year. Sixty-six of those codes provide for 40 hours a week; one for 44 hours; two for 45 hours; and four for 48 hours.

"The hours per week of the present bituminous code are 35. There are 17 codes, besides the bituminous code, that have a minimum of 35 hours per week or less; all of these codes have flexible provisions; seven allow a maximum of 40 hours, one of 44 hours, one of 46 hours, and eight of 48 hours.

"The 40-hour week is the prevailing regulation. Four hundred and eighty-seven of the 530 codes have a minimum of 40 hours or more, while 530, or every one except the bituminous code, permits a maximum of 40 hours a week or more. Only 18 of these codes have even minimum hours per week as low as the flat 35 hours per week now stipulated in the bituminous code.

"(2) A considerable number of codes

Summary of Hours Per Week Allowed Under the 531 Industrial Codes of Fair Competition Approved Before November 6, 1934.

Hours per Week	No. of Codes
27 to 40	1
32 to 48	4
35	11
35 to 40	6
35 to 44	1
35 to 46	1
35 to 48	4
36 to 40	10
36 to 42	1
36 to 44	2
36 to 45	1
36 to 48	9
37.5 to 40	1
37.5 to 44	1
37.5 to 45	1
40	66
40 to 42	1
40 to 44	27
40 to 45	14
40 to 46	1
40 to 48	338
40 to 49.5	1
40 to 52	3
40 to 54	10
40 to 56	9
44	1
44 to 48	3
44 to 52	1
45	2
48	4
48 to 52	2
48 to 54	1
48 to 63	1
54 to 60	1
No limit	1

TOTAL 531

Classification	Codes	Percent
Below 40 hours	44	8.3
Forty hours	66	12.4
Forty to sixty-three hours	421	79.3
TOTAL	531	100.0

contain flexible provisions with reference to hours per day, though not as many as contain such provisions with reference to hours per week. The present bituminous code specifies a flat seven hours per day throughout the year. Among the 531 codes there is only one that establishes a minimum work day of less than seven hours. That code permits a maximum of eight hours per day and flexible weekly hours running from 36 to 44, allowing more hours per week even in minimum weeks than are provided for in the bituminous code. There are three codes, besides the bituminous code, that specify a uniform seven hours per day; each of these has a flexible weekly provision under which 40 hours a week is permissible in busy seasons. There are nine other codes prescribing seven hours per day as a minimum; eight of these allow eight hours a day as a maximum and one, nine hours a day.

"The eight-hour day is the predominant provision. With the 65 codes containing no provisions with reference to hours per day included in the eight-hour

Summary of Hours Per Day Allowed By 531 Codes of Fair Competition Approved Before November 6, 1934.

Hours per Day	No. of Codes
6 to 8	1
7	4
7 to 8	8
7 to 9	1
7.5	2
7.5 to 9	1
8	315
* No limit	65
8 to 8.8	1
8 to 9	62
8 to 9.5	4
8 to 10	45
8 to 11	2
8 to 12	1
9	7
9 to 9.5	1
9 to 10	5
10	4
10 to 11	2

TOTAL 531

Classification	Codes	Percent
Below eight hours	17	3.2
Eight hours	380	71.6
Above eight hours	134	25.2

TOTAL 531 100.0

* "No Limit" classed as eight hours.

class, no fewer than 525 of the 531 codes allow eight hours a day or more in busy seasons, and 514 of them specify eight hours or more as the minimum hours of employment.

"(3) In this analysis the comparison has been between the uniform seven-hour day and 35-hour week specified in the present bituminous coal code and the corresponding provisions of other codes. It justifies the statement made above that the hours specified in the present bituminous coal code are lower than those specified in any other code. The uniform six-hour day and 30-hour week throughout the year, now demanded by the mine workers, is entirely outside the range of daily and weekly hours found in other codes.

"(4) The tendency toward increasing rather than decreasing hours of employment during the life of NRA is shown by the following figures: In the six months preceding Jan. 1, 1934, 195 codes were adopted, while during the year 1934, 336 codes were adopted. In the first period there were 27 codes, or 13.8 percent of the total number adopted, which prescribed minimum hours per week of less than 40, while during the second period only 17 codes, or 5.1 percent of the number adopted, prescribed such hours. Similarly, in the first period 13, or 6.7 percent of the total number, specified minimum hours per day of less than eight, while during the second period only four, 1.2 percent of the number adopted, specified such hours. The same tendency is illustrated by the character of the amendments to codes adopted after their original approval. Twelve

such amendments have been adopted. Of these six increased permissible hours per week, while only two decreased them; two increased permissible hours per day, three substituted definite hours for "no limit," while only one, the bituminous coal code, established shorter hours per day.

"(5) There are few industries that operate at a uniform rate throughout the year. It is to meet such periodic variations that 37.3 percent of the codes provide for flexible hours per day and 86.1 percent provide for flexible hours per week. There are few industries in which seasonal variation is more marked than it is in the bituminous mining industry, and yet the present bituminous code provides for a uniform seven-hour day and 35-hour week throughout the year, and the amendment advocated by the mine workers specifies a uniform six-hour day and 30-hour week throughout the year. Seasonal variations in the rate of activity of the bituminous mining industry are entirely due to the seasonal nature of the demand for its product, and nothing that operators or miners can do can materially alter the situation. The extent of the seasonal variations is seldom fully realized. For the country as a whole in any year maximum monthly production exceeds minimum monthly production by over 50 percent; in 1933 the excess was over 70 percent. In individual states and fields the percentage is far higher, since maximum months and minimum months are not identical in the several divisions. In 1931 there were six states in which the production of the minimum month was less than 40 percent of the production of the maximum month; in the state of Michigan it was only 10 percent.

IN modern times periods of active research usually lead to an increase in usefulness and hence to an expansion of markets for raw materials. Furthermore, the rate of increase of scientific investigation is a reliable index of the fertility of the subject in question.

With this in view, a survey was made of the number of scientific papers dealing directly with research on anthracite, which were reviewed in chemical abstracts over the period of 1929-1934, inclusive. This journal abstracts articles of chemical and related scientific interest appearing in all magazines and journals of technical and scientific importance throughout the world. It therefore reflects very accurately the trends in research. The following table gives the number of papers listed for each year and shows how this number has increased nearly six-fold over the six-year period:

Year	Number of Papers on Anthracite
1929	4
1930	7
1931	7
1932	11
1933	15
1934	23

NO! NO! A THOUSAND TIMES NO!



—Washington Daily News

It is of interest to note that seven of the 23 papers listed for 1934 were the result of research carried out under the auspices of the Anthracite Institute.—Anthracite Institute.

Copper

CORNELIUS F. KELLEY in the report to stockholders of the Anaconda Copper Mining Company states:

"The outlook for the non-ferrous metal industry at the beginning of the year was promising and showed steady improvement for the first six months. Thereafter the rapid recession of general business in the United States affected all heavy industries including that of copper. The seasonal activity which normally may be expected at the close of the third quarter did not develop, and as a result the volume of business transacted in the domestic market during the last half of the year was substantially below that of the first half. At the close of the year the trend was upward. In foreign markets the consumptive demand continued an upward trend practically throughout the year, reaching a peak in November.

"The world production of primary copper totaled 1,337,185 short tons, an increase of approximately 20 percent over 1933. Of this production 250,845 tons were domestic duty-free, and 1,086,340 were foreign. Blister stocks in the United States increased 21,930 tons and abroad 58,987 tons, a total of 80,917 tons. The production of refined copper was 1,256,268 tons, of which 228,915 tons were domestic and 1,027,353 were foreign. Production of primary refined copper, both domestic and foreign, was under consumption.

"World consumption of primary copper during 1934 is estimated at 1,408,128 tons, an increase of about 14 percent over 1933. The domestic market consumed 297,774 tons, a gain of only 1 percent over 1933, whereas consumption

abroad increased 19 percent to a new high record of 1,110,354 tons. Consumption in the United States was only about 35 percent of 1929, the peak year.

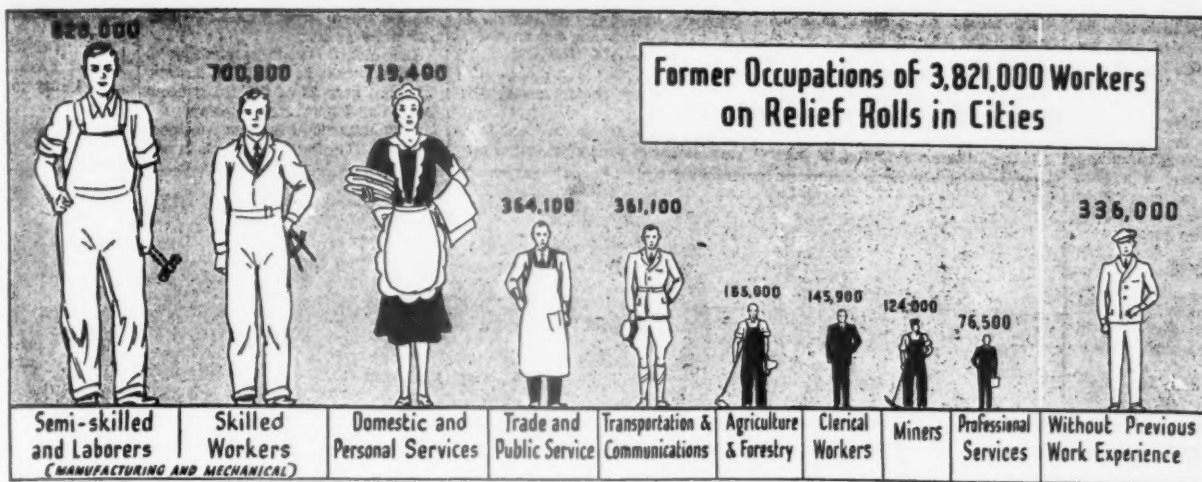
"Stocks of refined copper in the United States decreased 180,407 tons, while stocks abroad increased 28,547 tons, resulting in a net reduction of 151,860 tons in world refined stocks. The decrease of stocks in the United States was due largely to the exportation of duty free copper. As a result of such exports from the United States, together with increased production abroad, the foreign supply exceeded the demand of those markets. The increased production abroad did not cause any excessive building up of stocks, which were at low levels at the beginning of the year, and that market is still in a healthy condition so far as stocks are concerned. The statistical position of copper from the standpoint of the copper industry is materially better than it has been for a number of years.

"The domestic price of copper gradually improved due to heavy buying movements during the first half of the year until it reached 8.775c per pound f. o. b. refinery on June 14, which price has prevailed since. The price abroad was fairly uniform with the domestic price in the earlier part of the year, but beginning in May declined steadily and at the close of the year was approximately 2c per pound under the domestic price. The decline in the foreign price may be attributed principally to two causes, firstly the increased production abroad, and secondly and the more important factor, the sales by American producers of large quantities of duty-free copper on the foreign market."

LOUIS S. CATES, president of the Phelps-Dodge Corporation, in a statement in his annual report said:

"Statistics of the copper industry during 1934 compare favorably with those for the previous year. There was an increase in mine production, surplus stocks were substantially reduced and prices were somewhat higher. Production of copper in the United States amounted to about 360,000 tons during 1934, which is an increase of approximately 7½ percent over the total domestic output in 1933. Scrap metals accounted for about 30 percent of the 1934 production. During the first six months of the year, domestic consumption rose to a reasonably good level, but declined sharply after June. Among the causes for this decline were a lessening demand on the part of the heavy industries and the uncertainties facing the public utilities, which have acted as a deterrent to their expansion and consequent requirements for copper. Apparent domestic consumption, on the basis of refinery deliveries, was about 408,000 tons for the year, or 34,000 tons per month. This is approximately 5 percent higher than in 1933.

"Foreign production including new copper from mines and return from scrap is estimated at 1,120,000 tons. This compares with an output from similar



—The United States News

sources in 1933 of about 860,000 tons, or an increase of approximately 30 percent. Foreign consumption was greater than in any previous year, assuming that consumption was equal to deliveries of new copper. Production of foreign mines increased so substantially, however, that even an all-time peak in foreign consumption could not absorb it. Unless some means can be found to adjust foreign production with consumption, the price in the market abroad will remain at a low level.

"There are no published figures of stocks in the United States alone. Stocks in Canada, the United States and South America on Dec. 31, 1934, excluding stocks of manufacturers at refineries, amounted to 272,000 tons. This showed a decrease of 31 percent as compared with the same date in 1933, and 49 percent compared with Dec. 31, 1932. By far the greater part of these stocks are in the United States.

"The lowest point to which the domestic price of copper fell during the year was 7.75 cents delivered Connecticut Valley, in January. Thereafter the price slowly recovered and from June to the end of the year stood at 9.0 cents. The average price for the year was 8.65 cents, as compared with 7.25 cents in 1933. Foreign and domestic prices for the first four months of the year were about the same. Thereafter a differential gradually developed in favor of the domestic market. In October the foreign price reached a low point of 6.075 cents at United States refineries and on December 31 was 6.70 cents. The average foreign price for the year was 7.271 cents, as compared with 6.713 cents in 1933. If there had been no import tax on copper to protect the United States market, undoubtedly the domestic price would have been declined to a level similar to that of the foreign price.

"The Code of Fair Competition for the copper industry was finally approved in April, and made effective for sales and other provisions as of March 22, 1934. It provided for limited sales quotas and a regulated method of selling that has resulted in a stabilized market. The code has worked satisfactorily. It has provided for the collection of reliable information that had led to a more intelligent conduct of the business of the industry. The recent report of the National Resources Board to the President suggested permanent legislation for the control of national resource industries. As a means of obtaining conservation and preventing waste, the report recommends agreements in regard to the production of minerals, under proper regulation by some Government agency."

IN COMMENTING upon the present copper situation the *Wall Street Journal* makes the following interesting observations:

"In copper trade circles it is asserted that a tentative agreement has been reached by some of the domestic and foreign copper interests regarding curtailment of foreign production, but that sev-

eral interests still are to join in the agreement before it will become final.

"Important domestic interests who have been prominent in the curtailment conferences have declined to discuss what occurred thus far or what the form of agreement and its details might be. However, it has been evident from their attitude for several days that they are satisfied with what was accomplished at the various meetings.

"In some quarters it has been said that the tonnage of domestic companies to be sold abroad would be limited to a stated amount, and that this helped in reaching a settlement. However, there is no information regarding what such limits might be.

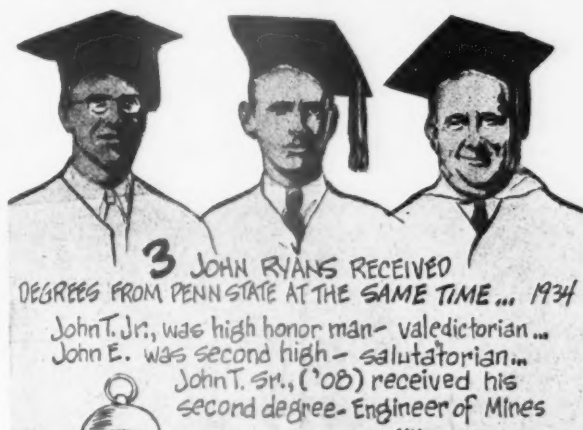
"An agreement at this time would be one of the most important and constructive steps taken by the copper interests in years. It would help to overcome the chief obstacle which has confronted the industry right along."

COMMITTEE B-5 on Copper and Copper Alloys, Cast and Wrought, is continuing its extensive standardization work and as a result three new tentative specifications were proposed. It is anticipated that these may become 1935 tentative standards.

The specifications cover wrought phosphor-bronze bearings and expansion plates for bridges and structures, and silicon-bronze bearings and plates for the same purpose.

The third specification will provide standardized requirements for a copper-silicon alloy wire for general purposes.

It will be recalled that this committee has prepared three specifications which were first published in 1934 as tentative covering various forms of material including sheet, plates, rods, bars and shapes, from copper-silicon alloys.



Believe It or Not—By Ripley

Officers of Committee B-5 on Copper and Copper Alloys, Cast and Wrought: Chairman: C. H. Mathewson, professor of metallurgy, Yale University. Secretary: D. K. Crampton, metallurgist, Chase Brass & Copper Company, Inc.

Lead and Zinc

ANNOUNCEMENT has been made by the American Zinc Institute that the Code of Fair Competition for the zinc industry was approved March 26, by the National Industrial Recovery Board. The code will become operative beginning April 8.

The code provides a basic maximum 40-hour week averaged over three-month periods, at minimum wages varying between 30 and 47½ cents an hour. The order of approval, however, limits the averaging provisions' operation to 60 days, at the end of which time the averaging provisions "shall be automatically stayed and the code amended . . . to eliminate the said averaging provisions, or the said averaging provisions shall be superseded by appropriate provisions submitted by the code authority which shall conform to established Administration policy."

An 8-hour daily limitation is placed in the maximum hours provisions of the code, and the Board is empowered to name an impartial investigator "to review conditions in the Mining Division of the industry and specifically concerning the application of the 8-hour provision in conformity with the state laws." The order of approval requires the impartial investigator to "review conditions in the Mississippi Valley, Southern and Southwestern Districts of the Mining Division of the industry for the purpose of reporting to the Board within 90 days from the effective date of this code, the amount of adjustment of code wages (not in excess of the recommendations of the Labor Advisory Board—35 cents per hour above ground and 40 cents per hour underground) possible in said Districts . . . and that the Board after reviewing said report and consulting with all interests concerned, may modify the minimum code wage provisions for said Districts of said Mining Division, as it may deem necessary upon the basis of said report." The code rates are 30 and 35 cents an hour, respectively, in all three Districts.

The code is to be administered by a code authority of six voting members, five to be selected from the members of the Executive Committee of the American Zinc Institute, and one elected by members of the industry not members of the Institute.

There are about 12,800 people employed in the industry, about two-thirds of them underground. The mine production of recoverable zinc declined from 775,000 tons in 1926 to 285,000 in 1932. In the same period world production declined from 1,768,000 tons to 1,074,000 tons.



RALPH M. ROOSEVELT, vice president of the Eagle-Picher Lead Co., and Eastern sales head of the Eagle-Picher Sales Co., recently announced his resignation from both companies, effective March 15, 1935. Mr. Roosevelt has decided to devote his entire time to the American Zinc Institute of which he has been president for about the past seven years.

With the death of John A. McCarthy, of the Anaconda Sales Co., and Henry S. Wardner, of the New Jersey Zinc Co., the executive committee of the American Zinc Institute, has been left with only one Eastern representative and, as a result, the work of the committee has been greatly handicapped on occasions. Mr. Roosevelt will henceforth be in a position to devote all his time to Institute affairs and is expected to be active in bringing unfinished work up to date.

Willard E. Maston, another vice president of the Eagle-Picher Lead Co., will succeed Mr. Roosevelt in New York.

TO SUPPLY the mineral industry promptly with data on zinc production and markets during the past year, the following information is furnished by the United States Bureau of Mines.

The production of distilled and electrolytic zinc at zinc reduction plants in the United States in 1934 amounted to 383,281 short tons, valued at \$32,962,000, increasing 14 percent in quantity and 16 percent in value from the production of 337,269 tons, valued at \$28,331,000, in 1933. The production in 1934 consisted of 365,366 tons of primary metal from domestic ore, 8,224 tons of primary metal from foreign ore and 19,691 tons of secondary metal. Of the total output, 76,657 tons was electrolytic zinc.

Pennsylvania, with a production of 100,728 tons, an increase of 61 percent over output in the preceding year, made the largest contribution of any state to the total output of primary distilled zinc. Oklahoma was second with 61,711 tons. The remainder of the distilled output was smelted in Arkansas, Illinois, Texas and West Virginia.

The supply of new zinc available for consumption in the United States in 1934 amounted to 342,000 tons, and increase of 20,000 tons, 6 percent over the available supply in 1933.

At the end of 1934 stocks at primary smelters and electrolytic refineries were 124,783 tons, compared with 110,487 tons on hand December 31, 1933, an increase of 13 percent.

SLAB ZINC PRODUCED IN THE UNITED STATES, 1932-1934 (In short tons)

	1932	1933	1934
Total output:			
Primary	207,148	307,182	365,590
Redistilled secondary..	14,718	30,087	19,691
	221,866	337,269	383,281
Primary zinc by origin:			
Domestic ore	207,148	306,010	355,366
Foreign ore (Mexico)		1,172	8,224
	207,148	307,182	365,590
Primary zinc by method of reduction:†			
Distillation—			
Arkansas	639	9,129	11,808
Illinois	67,607	60,140	55,778
Oklahoma	27,226	52,000	61,711
Pennsylvania	55,526	62,583	100,728
Other states	32,932	35,016	56,913
Electrolytic—			
Idaho	5,955	7,686	9,935
Illinois	3		
Montana	17,250	80,629	66,722
Total	207,148	307,182	365,590
Grade A (high grade) ..	44,195	104,842	116,720
Grade B (intermediate) ..	13,295	27,101	32,621
Grade C and D (brass special and selected) ..	66,844	57,318	49,657
Grade E (prime west'n) ..	97,532	148,008	190,283
Total	221,866	337,269	383,281
Average selling value, lb.:	Cents	Cents	Cents
Grade A	3.3	4.4	4.5
Grade B	3.3	4.4	4.5
Grade C & D	3.0	4.0	4.1
Grade E	2.9	4.1	4.1
All grades	3.0	4.2	4.3
Total value \$13,312,000	\$28,331,000	\$32,962,000	
Zinc dust	9,440	11,157	10,856

* Includes a small quantity of secondary electrolytic.

† States in which zinc was reduced from ore, part of which originated in other states.

APPARENT CONSUMPTION OF PRIMARY ZINC IN THE UNITED STATES, 1932-1934 (In short tons)

	1932	1933	1934
Supply:			
Stocks at smelters January 1	143,592	128,192	110,487
Production	207,148	307,182	365,590
Imports	849	1,936	1,725
Total available	351,089	437,310	475,802
Withdrawn:			
Exports—			
Foreign, from warehouse	*	*	*
Foreign, under drawback	136	700	†
Domestic	*9,481	*4,334	*8,567
Stocks at smelters December 31	128,192	110,487	124,783
Total withdrawn	137,809	115,521	134,000
Available for consumption	213,280	321,789	341,802

RETORT CAPACITY OF PRIMARY ZINC SMELTERS IN THE UNITED STATES, 1932-1934

	1932	1933	1934
Total retorts at active plants	75,644	77,412	71,500
Reports in operation at end of year	20,613	26,674	33,231

IMPORTS AND EXPORTS OF ZINC ORE, IN SHORT TONS, 1932-1934 (General)

	1932	1933	1934
Imported, zinc content	1,904	2,133	16,736
Exported, gross weight		1809	13,452
Remaining in warehouse, Dec. 31, zinc content	5,106	3,993	77,177

* Foreign included with domestic.
† Figures not yet available; an estimate is included in the total.

‡ Imports for consumption.

§ Not separately recorded; includes zinc dross.

¶ Not separately recorded; includes blocks, pigs and old.

	Zinc concentrates			Lead concentrates		
	This week	Last week	Year ago	This week	Last week	Year ago
Total stocks (sold and unsold).....	18,811	17,946	10,762	16,720	16,614	12,604
Net reserve stock.....	17,068	16,809	9,460	16,647	16,549	12,365
Production *.....	7,774	7,054	4,206	948	788	469
Shipments.....	6,909	5,921	6,035	842	658	581
Sales reported.....	7,515	5,852	5,789	850	390	709
* Included tailing mill production.....	1,746	1,563	1,425			
Base price—Joplin.....dollars..	26.00	26.00	30.00	33.00	33.00	42.50
Metal price—average for week zinc, E. St. Louis; lead, St. Louis.....cents..	3.900	3.895	4.375	3.400	3.400	3.900
Mill Statistics						
	This week	Last week	Year ago			
Mine mills operated 32 hours or more.....	26	26	18			
Mine mills operated less than 32 hours.....	1	0	4			
Tailing mills operated 96 hours or more.....	15	13	15			
Tailing mills operated less than 96 hours.....	9	1	0			
Total mills which produced more than 25 tons during week....	42	40	37			
Mills which produced less than 25 tons during week.....	6	7	9			
Total number of mills operated during week.....	48	47	46			

Mine Mills Operated This Week: Admiralty No. 2; American Diamond; Black Eagle; Byrd Mary Jane; C. M. & R. Bird Dog; See Sah & Wilbur; V. H. Barr; Century Scott; Dimes Wilson; Denny; E. P. Central; Diamond Joe; E. W. No. 4; Federal Jarrett; Bluebonnet; Interstate Woodchuck; K. & O. Discard; Lost Trail; Lucky O. K.; Mary M. Beck; Mid-Continent; Mission; New Blue Mound; Player; Rialto; St. Louis No. 4 and No. 8; U. Z. Royal; Velie Lion; Meteor; St. Nicholas.

Tailing Mills Operated This Week: Atlas; Bailey; Beck No. 3; Britt; Cardin; C. M. & R.; Beaver & Webber; King Brand; E. W. No. 7; Peru-Laclede; G. & S.; Semple Rightley; Skeleton; Mo. Chitwood; Tri-State Ottawa Youngman.

THE 17th annual meeting of the American Zinc Institute, Inc., will be held at the Hotel Statler, St. Louis, Mo., on Monday and Tuesday, April 22 and 23. Monday's meeting will cover, among other things, the problems the Zinc Industry is facing today, including relation of the mining and smelting branches of the industry to each other, and the relation of the entire industry to the Federal Government. Tuesday's meeting will be entirely given over to the industry's galvanizing campaign, its accomplishments, its failures and its future. As to entertainment features, the Institute is once more fortunate in securing the services of St. Louis' great producer, Mr. Edward J. Greve, than whom there is none better. Further details will be announced from time to time. Meanwhile, all members of the industry are urged to set aside these two days and to make special arrangements to be present, as the success of the industry at this time depends more than ever before on the cooperation of all its members.

THE eighty-ninth semi-annual meeting of the American Chemical Society will be held in the Hotel Pennsylvania in New York City during the week of April 22. This meeting will mark the three hundredth anniversary of the founding of the society in the United States. From advance reservations, the attendance is estimated at 10,000.

AMONG the many interesting papers presented at the annual meeting of the Rocky Mountain Coal Mining Institute, March 18 to 20, 1935, were:

"Essential Differences in Coal Mining in the Central Competitive and Rocky Mountain Coal Fields," Burt B. Brewster, editor, *Mining and Contracting Review*, Salt Lake City, Utah.

"Coal Astrology," Walter Duke, consulting engineer in charge of sales, Joy Mfg. Co.

"The Goodman Track Loader," Arthur Green, Western sales manager, Goodman Mfg. Co., Chicago.

"Benefits of Time Studies in Planning Work for Mechanical Loaders," C. E. Swann, chief engineer of the Union Pacific Coal Co., Rock Springs, Wyo., or Mr. Libby.

"Mechanical Loading," P. H. Burnell, superintendent, Owl Creek Coal Co., Gebo, Wyo.

"Building Greater Service into Wire Rope and Hidden Value," M. K. Stewart, American Steel and Wire Co., Denver.

"Self-Preservation with Some Comments on Mechanical Loading," Benedict Shubart, Shubart & Schloss, Denver, Colo.

"Benefits from Systematic Timbering," George Brown, superintendent, Superior, Wyo., mines, Union Pacific Coal Co.

"Latest Developments in Safety in Coal Mining," D. Harrington, chief engineer, Safety Division, Bureau of Mines, Washington, D. C.

"Storage Battery Locomotives in Castlegate," A. C. Watts, general superintendent, Utah Fuel Co., Castlegate, Utah.

"Paper and Slides on Aerovane Fan," A. E. Condon, ventilation engineer, Jeffrey Mfg. Co., Columbus, Ohio. (Mr. Jeffrey was designer of single- and double-stage Aerovane fan.)

"Value of Better Underground Illumination," Graham Bright, engineer, Mine Safety Appliances Co., Pittsburgh, Pa.

"Use of Goggles, Both Underground and on the Surface," V. O. Murray, safety engineer, Union Pacific Coal Co., Rock Springs, Wyo.

"Utah Cardox Development," R. R. Kirkpatrick, Standard Coal Co.

This was the twenty-third annual meeting of the Institute, of which H. C. Marchant is secretary.

"AMERICAN BUSINESS POLICIES" will be the theme of the 23rd annual meeting of the Chamber of Commerce of the United States, Washington, D. C., April 29 to May 2, according to preliminary announcement.

THE TWENTY-SIXTH Annual Convention of the Mine Inspectors' Institute of America will meet June 3, 4 and 5 at Beckley, W. Va. N. P. Rhinehart, Chief Department of Mines, West Virginia, with a committee, is planning for their entertainment and that of their ladies. J. T. Ryan is chairman of the program committee. J. G. Millhouse, mining engineer, is president.

THE National Safety Council, Inc. announces through its Managing Director, W. H. Cameron, that the Twenty-Fourth Annual Safety Congress, will be held in Louisville, Ky., October 14-18, 1935.

THE SEVENTEENTH annual boat trip of the Illinois Mining Institute will be held June 7-8-9, 1935, on the SS *Cape Girardeau*, leaving St. Louis, Mo., at 11 p. m., June 7, returning to St. Louis June 9 at 10 a. m.

THE College of Engineering of the University of Illinois, through its Department of Mining and Metallurgical Engineering and Department of Mechanical Engineering, will offer another Short Course in Coal Utilization at Urbana on June 11, 12 and 13, 1935. The registration at last summer's Short Course was 146, and included men from states as far distant as Utah, Alabama, South Carolina and Pennsylvania. There will be no charge for tuition or registration. The program is now being prepared and will probably be announced by April 1.

THREE MILLION DOLLARS has been made available to the Consolidated Coppermines Corporation by the RFC for the construction of a modern selective flotation mill for the treatment of its ores in the Robinson district of Nevada. Three hundred and thirty-five thousand dollars is also available for the development of a power plant if desired.

The plans for the mill call for a plant of 8,000 tons daily capacity, and it is estimated that 1,400 men will be employed for one year in the construction. The mill will be placed 1,500 feet west of the Emma Nevada shaft, and near the Morris Brooks shaft. It is down grade from the Emma Nevada shaft, to the millsite, and the 1,500-ft. haul corresponds to 25 miles to the Nevada Consolidated concentrator at McGill, now being used. Two important results seem assured—considerably reduced costs and the stimulation of mining in that district.

Senators Pittman and McCarran and Congressman Scrugham of Nevada were among those approving of the loan by the RFC.

A NEW STANDARD OF UNIFORMITY

"SA" Series

ELECTRO-GRAPHITIC BRUSHES

FOR

HEAVY DUTY D. C. SERVICE

The grades of the "SA" Series are indexed primarily on the basis of commutating properties



**EVERY BRUSH THE SAME
IN PHYSICAL PROPERTIES
AND PERFORMANCE**

*Write for specific grade recommendation
for your heavy duty D. C. service.*

NATIONAL CARBON COMPANY, INC.

Carbon Sales Division, Cleveland, Ohio

Unit of Union Carbide and Carbon Corporation

Branch Sales Offices: New York, Pittsburgh, Chicago, San Francisco

... modern Coal Preparation requires ..

*Modern Tipples
Remodeling Existing Tipples
Crusher Installations
Screening and Mixing Plants
Coal Washeries—Types to Suit Your
Requirements
Coal Cleaning by Air Process
Combination Wet and Dry Cleaning
Plants
Dedusting Plants
Revolving Dumps
Car Feeders*

Whatever your preparation needs may be, our engineers can find the proper answer. We invite you to make liberal use of our consulting service and Test Laboratory.

Roberts and Schaefer Co.

ENGINEERS and CONTRACTORS

1110 Wrigley Bldg.

CHICAGO, ILL.

2883 Beachwood Blvd.
PITTSBURGH, PA.

514 Ninth Avenue
HUNTINGTON, W. VA.

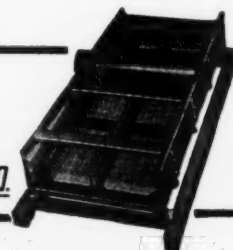
P. O. Box 55
DENVER, COLO.

UNIVERSAL VIBRATING SCREENS

Popular the World Over—Highest in Efficiency. Lowest in Cost. Write for Catalog

UNIVERSAL VIBRATING SCREEN CO.

RACINE - WISCONSIN



PERFORATED METALS
of Every Description
MINING SCREENS OF ALL KINDS

CHICAGO PERFORATING CO.
2445 West 24th Place
Canal 1459
CHICAGO, ILLINOIS

NEWS OF MANUFACTURERS

IN A four-page bulletin in two colors, the Sullivan Machinery Company announces its RHE-5 room hoist, a compact, sturdy, single drum electric motored hoist. The hoist is particularly adapted to car pulling work in room systems of mining but it is also suitable for many other uses underground, as well as for handy hoisting and pulling service above ground. In car pulling work in rooms, the hoist can be located in the heading from which point it can serve another one or more rooms by the use of Sullivan eight-inch rope guide sheaves spiked to the ties at each room neck.

In pitching veins the moving of loaded and empty cars is a time-wasting operation. Frequently the loaders must call for men from another room to lend a hand. Saving in labor and performance costs result from the installation of the RHE-5 room hoist.

THE Mine Safety Appliances Company of Pittsburgh has recently placed on the market an automatic carbon monoxide alarm. Prompt warning is given by the ringing of a gong when the concentration of monoxide begins to approach the danger point.

Owing to the fact that carbon monoxide poisoning is among the four outstanding causes of industrial fatalities, this instrument is of great importance, all the more so that it is said to be the only such device commercially available.

Before being put into production, the alarm was thoroughly tested, and was found to be entirely reliable under all probable working conditions.

FOR USE in its Bishop, Virginia, mine, the Pocahontas Corporation has ordered a 15-ton Baldwin-Westinghouse mine haulage locomotive. The locomotive is unique in that its height is only 32 inches to permit the operation under conditions of low head room.

CONTINUED improvement is reported at the Lewis Foundry & Machine Company, a subsidiary of Blaw-Knox Company, Pittsburgh, according to Frank Cordes, President of the Lewis Company.

In addition to orders previously reported, the company has booked an order for two additional finishing mills for Ball Brothers Company for their Muncey, Ind., plant. These mills will be used for rolling zinc sheets. The company has also received an order for a three high mill, complete with tables, from Bethlehem Steel Company, duplicating a mill furnished to this company about a year ago, except that the new mill will be used to manufacture sheet breakdowns up to sixty inches wide.

A KEENER INTEREST in learning to do their jobs a better way netted employees of the General Electric Company a total of \$29,218 during 1934. The annual suggestion report of the company reveals that 11,438 suggestions were made by employees during the past year and that 3,736 of these were adopted.

Nearly \$475,000 has been given to various employees for accepted suggestions under the award system in effect at all works of the company since 1926. The largest single award ever made was \$1,200, while the average recompense for adopted ideas is about \$10.

DURING THE past two years the coal mining business has been improving as evidenced by an increasing number of locomotives purchased by the mining industry. The Jewell Ridge Coal Corporation of Jewell Ridge, Va., has recently ordered a 20-ton Baldwin-Westinghouse haulage locomotive equipped with two 250-volt, 112 hp. each motor, and ten point semi-magnetic control arranged for series and parallel operation.

Some of the features include: Rolled steel wheel, Timken roller journal bearings, straight air brakes, air sanders, air whistle, individual blowers for main motors, panel with voltmeter and ammeter Type M resistor, bar steel frame with cross equalization, slider type trolley. Except for some additional equipment and minor dimension changes, this locomotive is to be practically a duplicate of a 20-ton Baldwin-Westinghouse locomotive in satisfactory operation since 1930.

THE Linde Air Products Company, 30 East 42nd St., New York, N. Y. announces that a new motion picture is now available for industrial and school showings. The film is entitled "The Multi-Flame Lindewelding Head," and provides a graphic description of the usefulness of this new fast method of pipe line welding introduced recently.

The film is available only in the 16 mm. size and will be furnished free of charge for showings to industrial groups, schools and similar meetings. Details will gladly be furnished upon request.

WORTHINGTON Pump and Machinery Company announce the following new pamphlets on their equipment: Worthington Plug and Feather Drill No. 211, and Worthington Centrifugal Pumps, Single-Stage Volute, Type R. Copies may be had upon request at the company headquarters at Harrison, N. J.

SPECIAL Attachments for Special Needs" is the title of a new booklet released by Caterpillar Tractor Co. illustrating and describing attachments ranging from bumpers to power take-offs and telling how they are used to add to the profit and satisfaction of tractor operation.

The book is intensely practical, showing installation, application and, in many cases, complete dimensions and operating data. Copies may be secured without charge, from the manufacturers.

TRAYLOR Engineering & Manufacturing Company announce a new Circular, No. 95, "For Worthwhile Efficiency Bell-Shaped Crushing Heads Must Be Used With Curved Concaves."

Any reader may have a copy of his own upon application to the company at Allentown, Pa.

PRACTICAL examples of the use and economy of shearing machines is given in considerable detail in the Eickhoff Bulletin No. 11/12, November-December, 1934. Copies will be furnished upon request to Eickhoff Brothers, Scranton, Pa.

ROBINS Conveying Belt Company announce a new Vibrex Screen Bulletin No. 93. Copies are obtainable upon request to 15 Park Row, New York City.

A NEW two-stage, air-cooled portable compressor has been added to Ingersoll-Rand's comprehensive line of "Portables." It is known as the "Model 85," is driven by a Waukesha gasoline engine, and has a capacity of 85 c. f. m. at 100 pounds.

The new Model 85 compressor has two low-pressure and one high-pressure air-cooled cylinders and an air-cooled intercooler. It is claimed by the manufacturer that the air cooling, two-stage compression, intercooling, and certain manufacturing refinements all combine to make a saving of up to 25 percent over the fuel cost of water-cooled, single-stage portable compressors; furthermore, that two-staging gives increased efficiency at high altitudes and in hot climates over single-stage units. Cylinders and valve temperatures are said to be 200 degrees lower than in single-stage units, resulting in tighter valves and longer-maintained high efficiency.

Other sizes in which the I-R two-stage, air-cooled portable compressor is made are: Models Nos. 60, 160, 210, 105, and 315. These sizes are available either gasoline-engine driven or oil-engine driven.

Bulletin No. 2149, describing the new Model 85; or No. 2100, describing the entire line, can be obtained from Ingersoll-Rand Company, 11 Broadway, New York, or any branch office.

INDEX TO ADVERTISERS

Carnegie Steel Co.....	3
Chicago Perforating Co.....	48
Dupont de Nemours & Co., Inc., E. I.....	6-7
Gibson Hotel	5
Goodman Manufacturing Co.....	3
Grasselli Chemical Co.....	Third Cover
Hoffman Bros. Drilling Co.....	50
Lake, M. C.....	50
Link-Belt Co.....	Back Cover
Loftus, Peter F.....	50
Mott Core Drilling Co.....	50
National Carbon Co.....	48
Netherland Plaza Hotel.....	5
Pennsylvania Drilling Co.....	50
Pierce & Co., James H.....	50
Roberts & Schaefer Co.....	48
Robinson Ventilating Co.....	50
Universal Vibrating Screen Co.....	48

DIAMOND CORE DRILLING CONTRACTORS

We make Borings for Coal, Clays and all Minerals.
Up-to-date Equipment. Gasolene, Steam and Electric
Outfits. Ask us for estimates.
MOTT CORE DRILLING COMPANY
HUNTINGTON, W. VA.

O. C. Hoffman, Pres. Established 1902 L. H. Hoffman, Treas.

HOFFMAN BROS. DRILLING CO.

—CONTRACTORS—

DIAMOND CORE DRILLING

PUNXSUTAWNEY, PA.

Our specialty—Testing bituminous coal lands
Satisfactory cores guaranteed

ROBINSON VENTILATING COMPANY

**Fans and Blowers
Ventilating Engineering Service**

ZELIENOPLE
PENNSYLVANIA



We Look Into the Earth

By using Diamond Core Drills.
We prospect Coal and Mineral
Lands in any part of North or
South America.

Pennsylvania Drilling Co.
Pittsburgh, Pa.
Drilling Contractors

PETER F. LOFTUS

Consulting Engineers

ENGINEERING AND ECONOMIC SUR-
VEYS, ANALYSES AND REPORTS ON
POWER APPLICATIONS AND POWER
COST PROBLEMS OF THE COAL MINING
INDUSTRY

Oliver Building Pittsburgh, Pa.

M. C. LAKE

Consulting Geologist and Mining Engineer
Appraisals, Examinations, Explorations
1300 Leader Bldg. 909 Fidelity Bldg.
Cleveland, Ohio Duluth, Minn.

**Are You a Member of
The American Mining Congress?**

THE MINING CONGRESS JOURNAL

JAMES H. PIERCE & COMPANY ENGINEERS AND MINE MANAGERS

A successful background in the practical solution
of difficult engineering and managerial problems.
Reports—Valuations—Appraisals—Cost Analysis
Scranton Electric Building, Scranton, Pa.
Whitehall Building, New York, N. Y.

An important development in wood preservation

NOW

AN IMPROVED SALT PRESERVATIVE
FOR TREATING TIMBERS THAT IS
MORE *Effective*
for PREVENTING ROT



*This booklet
gives full
Information*

GRASSELLI *Chromated* ZINC CHLORIDE

FOR wood preservation, Zinc Chloride has long been known as the standard salt treating agent. Grasselli Zinc Chloride has been used for preserving wood for many years—and leads for treating permanent construction, both above ground and in underground timbering, where clean treatment is involved.

Improvement is the watchword of today. Always pioneering in product development, Grasselli engineers were assigned the task of developing an improved salt preservative. After extensive research and tests, we announce to industry—GRASSELLI CHROMATED ZINC CHLORIDE.

Grasselli Chromated Zinc Chloride is definitely

more toxic to the fungi that causes rot and decay; is resistant to termites; and is retardant to fire. Its use as a salt preservative will be even more economical than zinc chloride to factories, mines, public utilities, highway commissioners, etc., for reducing maintenance expense in the replacement of timbers due to these causes.

Wood treated with Grasselli Chromated Zinc Chloride is clean, similar in color to untreated wood, odorless, non-volatile, and readily paintable.

Commercial treating plants are located conveniently near you to treat timbers under pressure . . . Write us for their names.

THE GRASSELLI CHEMICAL COMPANY, INC.

Founded 1839 Subsidiary of E. I. DuPont de Nemours & Co., Inc. Cleveland, Ohio

New York and Export Office: 350 Fifth Avenue

BRANCHES AND WAREHOUSES



Albany
Birmingham

Boston
Charlotte

Chicago
Cincinnati

Detroit
Milwaukee

New Haven
New Orleans

Philadelphia
Pittsburgh

St. Louis
St. Paul

San Francisco, 584 Mission Street
Los Angeles, 2260 East 15th Street




Represented in Canada by CANADIAN INDUSTRIES, LTD. Acids and General Chemicals Division—Montreal and Toronto



LINK-BELT CHAINS & SPROCKETS

*for Drives and Conveyors
fit Industry's Needs*

HUGE stocks of chains made of Promal, malleable iron and steel for every conveying and power transmitting service—thousands of cut and cast tooth sprockets built to fit and work with chains of standard pitch—a complete line of conveyor and power transmission accessories of all types—carried at convenient points throughout the country by jobbers and at our plants and warehouses.

Look for the Link-Belt identifying trade  mark. It assures you of the highest quality that the leading chain manufacturer can produce. Send for 1024 page general catalog engineering data book No. 600, showing the complete Link-Belt line. Address nearest office.

LINK-BELT COMPANY

5171-C

The Leading Manufacturer of Equipment for Handling Materials and Transmitting Power
INDIANAPOLIS CHICAGO PHILADELPHIA ATLANTA SAN FRANCISCO TORONTO
Denver, Seattle, Pittsburgh, Wilkes-Barre, St. Louis, Huntington, W. Va., Kansas City, Mo.
Offices in Principal Cities

